

CRPL-F147 PART A

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PART A  
IONOSPHERIC DATA

ISSUED  
NOVEMBER 1956

U. S. DEPARTMENT OF COMMERCE  
NATIONAL BUREAU OF STANDARDS  
CENTRAL RADIO PROPAGATION LABORATORY  
BOULDER, COLORADO



## IONOSPHERIC DATA

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## SYMBOLS, TERMINOLOGY, CONVENTIONS

Beginning with data reported for January 1952, the symbols, terminology, and conventions for the determination of median values used in this report (CRPL-F series) conform as far as practicable to those adopted at the Sixth Meeting of the International Radio Consultative Committee (C.C.I.R.) in Geneva, 1951. Excerpts concerning symbols and terminology from Document No. 626-E of this Meeting are given on pages 2-7 of the report CRPL-F89, "Ionospheric Data," issued January 1952. Reprints of these pages are available upon request.

Beginning with data for January 1945, median values are published wherever possible. Where averages are reported, they are, at any hour, the average for all the days during the month for which numerical data exist.

The following conventions are used in determining the medians for hours when no measured values are given because of equipment limitations and ionospheric irregularities. Symbols used are those given in Document No. 626-E referred to above, plus an additional symbol, R: "Scaling of characteristic is influenced or prevented by absorption in the neighborhood of the critical frequency," (May 1955). Also, beginning with January 1956, additional meanings are assigned to T: A smoothed value which better fits the observations, replacing a doubtful or clearly inconsistent observed value; and to U:  $foF2$  minus  $foF1$  is 0.5 Mc or less (used with (M3000)F2).

a. For all ionospheric characteristics:

Values missing because of A, C, F, L, M, N, Q, R, S, or T are omitted from the median count.

b. For critical frequencies and virtual heights:

Values of  $foF2$  (and  $foE$  near sunrise and sunset) missing because of E are counted as equal to or less than the lower limit of the recorder. Values of  $h'F2$  (and  $h'E$  near sunrise and sunset) missing for this reason are counted usually as equal to or greater than the median. Other characteristics missing because of E are omitted from the median count.

Values missing because of G are counted:

1. For  $foF2$ , as equal to or less than  $foF1$ .
2. For  $h'F2$ , as equal to or greater than the median.

The symbol W is included in the median count only when it replaces a height characteristic; the symbol D, only when it replaces a frequency characteristic.

Values missing for any other reason are omitted from the median count.

c. For MUF factor (M-factors):

Values missing because of G or W are counted as equal to or less than the median.

Values missing for any other reason are omitted from the median count.

d. For sporadic E (Es):

Values of fEs missing because of E or G (and B when applied to the daytime E region only) are counted as equal to or less than the median foE, or equal to or less than the lower frequency limit of the recorder.

At night B for fEs is counted on the low side when there is a numerical value of foF2; otherwise it is omitted from the median count.

Values of fEs missing for any other reason, and values of h'Es missing for any reason at all are omitted from the median count.

Beginning with data for November 1945, doubtful monthly median values for ionospheric observations at Washington, D. C., are indicated by parentheses, in accordance with the practice already in use for doubtful hourly values. The following are the conventions used to determine whether or not a median value is doubtful:

1. If the count is four or less, the data are considered insufficient and no median value is computed.
2. For the F2 layer or sporadic E, if the count is from five to nine, the median is considered doubtful. The E and F1 layers are so regular in their characteristics that, as long as the count is at least five, the median is not considered doubtful.
3. For all layers, if more than half of the data used to compute the median are doubtful (either doubtful or interpolated), the median is considered doubtful.

The same conventions are used by the CRPL in computing the medians from tabulations of daily and hourly data for stations other than Washington, beginning with the tables in IRPL-F18.

The tables and graphs of ionospheric data are correct for the values reported to the CRPL, but, because of variations in practice

in the interpretation of records and scaling and manner of reporting of values, may at times give an erroneous conception of typical ionospheric characteristics at the station. Some of the errors are due to:

- a. Differences in scaling records when spread echoes are present.
- b. Omission of values when  $f_oF_2$  is less than or equal to  $f_oF_1$ , leading to erroneously high values of monthly averages or median values.
- c. Omission of values when critical frequencies are less than the lower frequency limit of the recorder, also leading to erroneously high values of monthly average or median values.

These effects were discussed on pages 6 and 7 of the previous F-series report IRPL-F5.

Ordinarily, a blank space in the fEs column of a table is the result of the fact that a majority of the readings for the month are below the lower limit of the recorder or less than the corresponding values of  $f_oE$ . Blank spaces at the beginning and end of columns of  $h'F_1$ ,  $f_oF_1$ ,  $h'E$ , and  $f_oE$  are usually the result of diurnal variation in these characteristics. Complete absence of medians of  $h'F_1$  and  $f_oF_1$  is usually the result of seasonal effects.

The dashed-line prediction curves of the graphs of ionospheric data are obtained from the predicted zero-muf contour charts of the CRPL-D series publications. The following points are worthy of note:

- a. Predictions for individual stations used to construct the charts may be more accurate than the values read from the charts since some smoothing of the contours is necessary to allow for the longitude effect within a zone. Thus, inasmuch as the predicted contours are for the center of each zone, part of the discrepancy between the predicted and observed values as given in the F series may be caused by the fact that the station is not centrally located within the zone.
- b. The final presentation of the predictions is dependent upon the latest available ionospheric and radio propagation data, as well as upon predicted sunspot number.
- c. There is no indication on the graphs of the relative reliability of the data; it is necessary to consult the tables for such information.



## PREDICTED AND OBSERVED SUNSPOT NUMBERS

The following predicted smoothed 12-month running-average Zürich sunspot numbers were used in constructing the contour charts:

Month	Predicted Sunspot Number										
	1957	1956	1955	1954	1953	1952	1951	1950	1949	1948	1947
December		150	42	11	15	33	53	86	108	114	126
November		147	35	10	16	38	52	87	112	115	124
October		135	31	10	17	43	52	90	114	116	119
September		119	30	8	18	46	54	91	115	117	121
August		105	27	8	18	49	57	96	111	123	122
July		95	22	8	20	51	60	101	103	125	116
June		89	18	9	21	52	63	103	108	129	112
May		77	16	10	22	52	68	102	108	130	109
April	150*	68	13	10	24	52	74	101	109	133	107
March	150*	60	14	11	27	52	78	103	111	133	105
February	150*	53	14	12	29	51	82	103	113	133	90
January	150*	48	12	14	30	53	85	105	112	130	88

\*This number is believed representative of solar activity at a maximum portion of the current sunspot cycle.

The latest available information follows concerning the corresponding observed Zürich numbers (some of which may be subject to minor change) beginning with the minimum of April 1954.

Observed Sunspot Number												
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1954				3	4	4	5	7	8	8	9	12
1955	14	16	19	23	29	35	40	46	55	64	72	80
1956	88	97	108	119								

## WORLD - WIDE SOURCES OF IONOSPHERIC DATA

The ionospheric data given here in tables 1 to 40 and figures 1 to 80 were assembled by the Central Radio Propagation Laboratory for analysis and correlation, incidental to CRPL prediction of radio propagation conditions. The data are median values unless otherwise indicated. The following are the sources of the data in this issue:

Meteorological Service of the Belgian Congo and Ruanda-Urundi:  
Leopoldville, Belgian Congo .

British Department of Scientific and Industrial Research, Radio  
Research Board:

Falkland Is.  
Ibadan, Nigeria (University College of Ibadan)  
Inverness, Scotland  
Singapore, British Malaya  
Slough, England

Radio Wave Research Laboratories, National Taiwan University, Tai-  
peh, Formosa, China:  
Formosa, China

Danish National Committee of URSI:  
Godhavn, Greenland

French National Center for Telecommunications Studies:  
Djibouti, French Somaliland  
Tananarive, Madagascar

Christchurch Geophysical Observatory, New Zealand Department of  
Scientific and Industrial Research:  
Christchurch, New Zealand

Research Institute of National Defence, Stockholm, Sweden:  
Upsala, Sweden

Royal Board of Swedish Telegraphs, Radio Department, Stockholm,  
Sweden:  
Lulea, Sweden

United States Army Signal Corps:

Adak, Alaska  
Ft. Monmouth, New Jersey  
Okinawa I.  
Thule, Greenland  
White Sands, New Mexico

National Bureau of Standards (Central Radio Propagation Laboratory):

Fairbanks, Alaska (Geophysical Institute of the University  
of Alaska)  
Maui, Hawaii  
Narsarssuak, Greenland  
Panama Canal Zone  
Point Barrow, Alaska  
Puerto Rico, W. I.  
San Francisco, California (Stanford University)  
Washington, D. C.



## HOURLY IONOSPHERIC DATA AT WASHINGTON, D. C.

The data given in tables 41 through 51 follow the scaling practices given in the report IRPL-C61, "Report of International Radio Propagation Conference," pages 36 to 39, and the median values are determined by the conventions given above under "Symbols, Terminology, Conventions." Beginning with September 1949, the data are taken at Ft. Belvoir, Virginia.

The interpretation of a cell is as follows: U F  
32

The U is a weight meaning doubtful. Other weights are I, interpolated, D, greater than, and E, less than. Absence of a letter in the upper left position means full weight is given to the observation.

Symbols such as F above are given in the upper right position.

There should be no difficulty in the placing of the decimal point. For the time being, a final zero will be found in each value of foF1 and foE. Thus at a later date it will be possible to register more closely scaled values of these characteristics, whenever such are reported.

## ERRATUM

CRPL-F146, p. 49, fig. 69: At 1743, fEs reading should have been <3.0.

EXAMPLES OF IONOSPHERIC VERTICAL SOUNDINGS  
BARROW, ALASKA; SEPT. 7, 1956

The following ionograms were obtained at the NBS Barrow, Alaska vertical sounding station. They are typical of day and night conditions for September at this geomagnetic latitude. Ionospheric data are scaled directly from these records onto the daily f-plot, a graph of frequency characteristics vs. time. The f-plot for the day represented by these soundings is found on the following page.

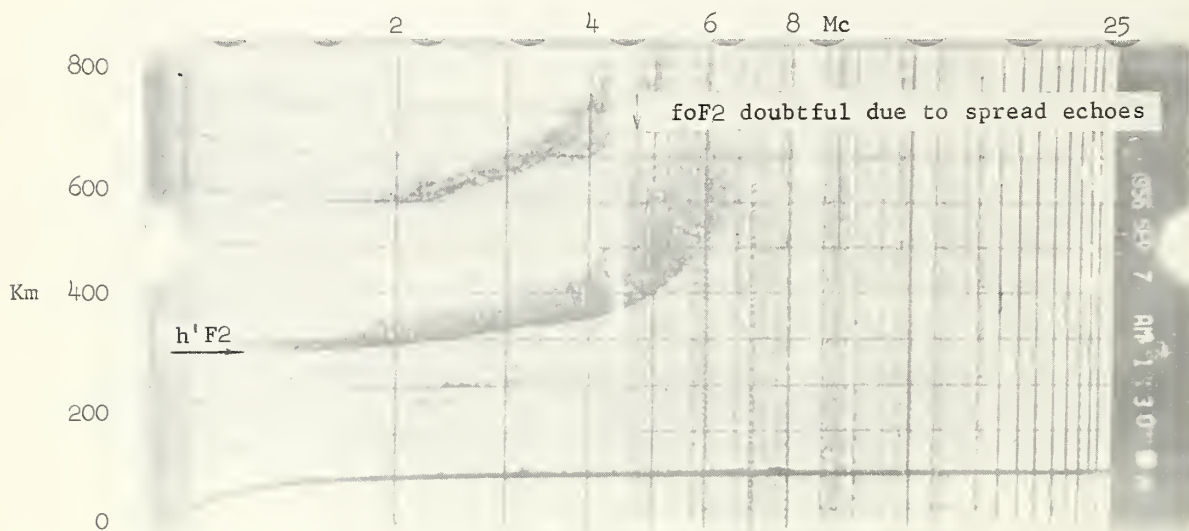


Fig. A. Barrow, Alaska, Sept. 7, 1956, 0130 hours, 150°W time.

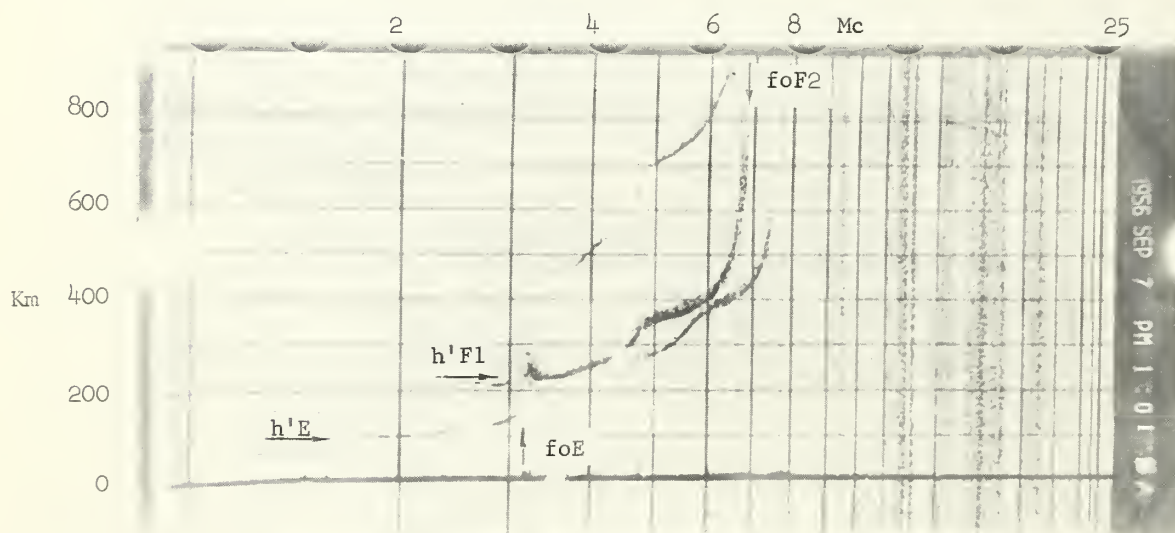


Fig. B. Barrow, Alaska, Sept. 7, 1956, 1301 hours, 150°W time.

TIME

00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23

## KEY

- f?
- x fx
- o fo
- z fz
- | SPREAD
- f-min-F
- f-min

FREQUENCY (MC)

11

10

9

8

7

6

5

4

3

2

1

0

1

2

3

4

5

6

7

8

9

10

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## TABLES OF IONOSPHERIC DATA

Table 1

Washington, D. C. (38.7°N, 77.1°W)

October 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	270	6.7						2.80
01	270	6.4					(2.5)	2.85
02	260	6.1					(3.0)	2.85
03	250	5.8					(2.5)	2.85
04	250	5.5						2.80
05	260	4.9						2.80
06	260	5.5						2.95
07	240	8.6	---	---	119	2.2		3.20
08	240	10.7	230	---	109	2.8		3.20
09	240	12.0	220	---	109	3.1	3.1	3.10
10	240	12.5	215	---	105	3.3		3.00
11	250	12.7	215	---	105	3.4		2.90
12	250	12.9	220	---	109	3.5		2.90
13	(250)	13.0	220	---	109	3.5		2.80
14	260	12.8	225	---	109	3.4		2.80
15	250	12.6	230	---	109	3.2		2.80
16	250	12.5	240	---	111	2.7		2.85
17	230	11.8	235	---	119	2.2		2.95
18	220	10.8					2.3	2.95
19	230	9.2					(3.3)	2.90
20	240	8.3					(3.0)	2.85
21	250	7.6						2.90
22	250	7.1						2.80
23	260	7.0					(2.7)	2.85

Time: 75.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 2

Narsarssuak, Greenland (61.2°N, 45.4°W)

September 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00								
01							4.8	
02							3.8	
03							3.6	
04		---					3.6	----
05		(4.9)					3.6	----
06		(5.8)			151	2.2	2.6	(2.90)
07		6.6		---	117	2.4		(3.00)
08		6.9		---	115	2.7		3.05
09		7.4		---	113	3.0		2.90
10		8.2		(4.9)	109	3.2		2.85
11		8.2		(5.0)	111	(3.2)		2.80
12		8.6		4.8	111	(3.3)		2.75
13		8.5		(5.0)	109	3.2		2.75
14		8.2		(4.8)	111	3.2		2.75
15		7.8		4.6	111	3.0		2.80
16		8.3		---	115	2.8		2.80
17		7.1		---	125	2.6		2.80
18		(7.0)		---	129	2.4		(2.85)
19		(7.4)		---	---	---	3.8	(2.80)
20		---		---	---	---	4.6	----
21		---		---	---	---	3.9	----
22		---		---	---	---	4.6	----
23		---		---	---	---	4.2	----

Time: 45.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 3

Upsala, Sweden (59.8°N, 17.6°E)

September 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	325	4.8					2.7	2.7
01	315	4.6					2.7	2.7
02	325	4.4					2.9	2.7
03	325	3.8					2.8	2.7
04	320	3.4				E	2.9	2.7
05	285	4.2				E	2.4	2.9
06	275	5.4	260	(3.40)	130	1.90	2.4	3.0
07	260	6.5	250	4.00	115	2.50	3.0	3.0
08	290	7.2	240	4.60	110	2.80	3.8	2.9
09	310	8.0	240	4.80	110	3.00	4.4	2.9
10	295	8.4	235	5.00	105	3.20	4.7	2.9
11	310	8.6	225	5.20	105	3.30	4.1	2.8
12	300	8.9	230	5.25	105	3.30	3.4	2.8
13	300	9.1	240	5.20	105	3.35		2.9
14	290	9.2	240	5.20	105	3.20		2.9
15	290	8.6	240	4.80	110	3.00		2.9
16	275	8.8	245	4.45	110	2.70		2.9
17	260	9.0	260	3.70	120	2.20	2.6	2.9
18	245	8.5	---	---		1.50	2.8	3.0
19	245	8.2	---	---		E	2.6	3.0
20	240	7.1	---	---		---	2.6	2.9
21	250	6.3					2.4	2.9
22	270	5.6					2.6	2.8
23	310	5.0					2.4	2.7

Time: 15.0°E.

Sweep: 1.4 Mc to 17.0 Mc in 6 minutes, automatic operation.

Table 4

Adak, Alaska (51.9°N, 176.6°W)

September 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	320	4.6						2.50
01	330	4.2						2.50
02	330	4.4						2.50
03	340	4.0						2.45
04	340	3.9						2.40
05	330	4.0						2.55
06	260	5.6	275	---	129	---	2.2	2.85
07	240	7.4	240	4.1	115	(2.7)	2.9	2.90
08	240	8.8	230	---	109	(3.1)		2.90
09	270	9.7	225	4.8	109	(3.4)	3.6	2.90
10	290	9.8	220	5.1	105	(3.5)	3.6	2.85
11	320	10.2	220	---	105	(3.6)	3.7	2.80
12	310	10.4	215	---	109	(3.5)	3.6	2.80
13	260	10.1	220	---	110	(3.5)	3.5	2.80
14	240	9.9	225	---	109	(3.4)	3.4	2.80
15	240	9.8	230	---	109	(3.2)	3.2	2.85
16	240	9.8	240	---	111	(2.9)		2.90
17	240	9.3	---	---	119	(2.5)	3.0	2.95
18	240	8.9	---	---	---	---	2.2	3.00
19	240	8.0						2.95
20	240	6.8					2.4	2.90
21	260	6.0					2.2	2.85
22	270	5.3						2.70
23	300	4.8						2.60

Time: 180.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 27 seconds.

Table 5

Ft. Monmouth, New Jersey (40.3°N, 74.1°W)

September 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	6.5					(2.7)	2.65
01	280	6.2						2.60
02	270	6.2					(2.5)	2.65
03	280	5.9					(1.8)	2.60
04	270	(5.6)					(2.7)	2.65
05	260	(4.8)					(2.5)	(2.80)
06	250	6.2	---	---	<130	(2.1)		3.10
07	240	8.0	240	---	111	2.7	2.7	3.10
08	250	9.0	220	---	111	3.2		3.10
09	250	9.8	220	4.5	109	3.6		3.00
10	280	10.2	215	5.4	109	(3.7)		2.85
11	260	10.5	205	5.0	109	3.8		2.80
12	280	10.8	210	5.4	109	3.8		2.80
13	280	10.8	215	5.5	109	3.8		2.75
14	310	10.8	220	5.4	109	3.7		2.75
15	300	10.7	230	5.2	109	3.5		2.80
16	250	10.7	230	---	109	3.2		2.80
17	240	10.2	<250	---	111	2.6		2.80
18	240	9.9						2.85
19	240	9.2					3.5	2.80
20	240	8.3					(2.8)	2.80
21	260	7.7						2.70
22	270	7.4						2.70
23	290	7.0						2.60

Time: 75.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 6

White Sands, New Mexico (32.3°N, 106.5°W)

September 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	6.0					2.3	2.60
01	290	5.8					1.3	2.65
02	280	5.6					2.5	2.65
03	270	5.4					(2.2)	2.70
04	270	5.4					3.8	2.60
05	(270)	5.3					2.6	2.65
06	260	6.4					2.9	3.00
07	240	8.7	240	---	109	(2.7)	3.2	3.10
08	250	9.7	230	---	109	(3.3)	4.0	3.05
09	260	10.4	220	---	107	(3.5)	3.6	2.90
10	280	10.9	210	---	107	(3.8)		2.75
11	310	11.4	210	---	108	(4.0)		2.75
12	320	11.8	215	5.7	109	(4.0)		2.75
13	330	11.9	220	---	(111)	(4.0)		2.75
14	320	11.8	220	---	(111)	(3.9)		2.70
15	310	11.6	230	---	109	(3.6)		2.75
16	260	11.4	230	---	109	(3.2)	3.3	2.80
17	250	11.0	240	---	112	(2.6)	3.7	2.85
18	230	10.0					3.0	2.95
19	220	8.7					2.5	2.90
20	230	7.4					2.8	2.80
21	250	6.4					2.7	2.75
22	(270)	6.3					3.3	2.70
23	280	6.2					2.6	2.60

Time: 105.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 7

Okinawa I. (26.3°N, 127.8°E)

September 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	250	13.0					2.7	2.90
01	240	12.4					2.9	2.90
02	250	11.2					3.2	2.90
03	240	9.6					2.0	2.90
04	240	7.8					1.6	2.80
05	240	6.6					2.0	2.90
06	270	7.0					2.2	2.90
07	240	10.0	240	---	(117)	---	4.1	3.30
08	230	11.0	230	---	(111)	(3.0)	4.9	3.20
09	---	11.2	220	---	110	(3.4)	5.0	3.00
10	---	11.8	215	---	(111)	(3.8)	5.2	2.70
11	---	13.1	210	---	111	(4.0)	5.4	2.70
12	(350)	14.4	220	---	111	(4.2)	5.3	2.70
13	350	15.3	220	---	111	(4.1)	5.3	2.65
14	360	16.3	225	---	111	(4.0)	5.2	2.65
15	350	16.3	230	---	111	(3.8)	4.9	2.70
16	330	16.3	240	---	111	(3.5)	5.0	2.75
17	(300)	15.9	250	---	111	(3.1)	5.6	2.80
18	260	15.0	260	---	---	---	5.0	2.85
19	260	14.8					5.4	2.80
20	260	16.5					5.0	2.70
21	260	16.3					4.2	2.70
22	270	15.0					3.6	2.80
23	260	13.6					3.2	2.90

Time: 135.0°E.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 8

Formosa, China (25.0°N, 121.5°E)

September 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	(12.7)					2.6	(2.8)
01	260	11.2					2.6	2.9
02	260	9.6					2.6	2.85
03	260	9.2					2.4	2.8
04	250	(8.8)					2.4	(2.8)
05	260	8.9					2.8	2.9
06	260	8.6					3.0	3.0
07	240	(10.1)	---	---	---	---	3.6	(3.1)
08	240	11.2	220	---	120	3.4	4.1	3.0
09	(240)	11.8	220	---	120	(3.6)	4.0	2.8
10	(260)	13.1	220	(5.2)	120	4.0	4.5	2.6
11	---	14.8	220	---	---	---	---	2.6
12	---	16.4	---	---	---	---	---	2.5
13	---	17.1	---	---	---	---	5.0	2.55
14	---	17.8	230	---	---	---	3.1	2.6
15	---	(18.5)	240	---	---	---	4.0	(2.6)
16	(290)	>18.5	240	---	120	3.4	4.2	(2.7)
17	270	(17.4)	240	---	---	---	3.9	(2.7)
18	280	>17.0					3.0	(2.8)
19	280	>16.4					2.9	(2.75)
20	280	(17.5)					(2.8)	(2.8)
21	280	>17.5					(2.8)	(2.8)
22	280	(18.0)					(2.9)	(2.8)
23	280	(16.1)					2.9	(2.8)

Time: 120.0°E.

Sweep: 1.1 Mc to 19.5 Mc in 15 minutes, manual operation.

Table 9

Maui, Hawaii (20.8°N, 156.5°W)

September 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	10.6						3.00
01	250	9.6						3.00
02	240	8.4						3.05
03	240	6.9						3.00
04	260	5.8						2.65
05	270	5.0						2.75
06	300	5.1						2.80
07	250	8.2	---	---	121	2.4		3.10
08	250	9.9	235	---	113	3.1	4.4	3.00
09	(270)	11.0	230	---	111	3.5	4.6	2.80
10	(330)	12.2	225	---	111	3.8	4.6	2.70
11	350	13.0	220	6.4	111	4.0	4.6	2.70
12	360	14.0	220	6.6	111	4.1	4.7	2.70
13	360	14.5	230	6.8	111	4.1	4.4	2.70
14	350	14.5	230	(6.9)	111	4.0	4.2	2.75
15	340	14.5	230	---	111	3.8	4.1	2.80
16	320	14.0	230	---	111	3.4	4.1	2.85
17	280	13.2	250	---	117	2.8	4.6	2.90
18	260	13.0	---	---	125	2.0	3.5	3.00
19	250	12.6					3.8	3.00
20	260	12.2					3.0	2.90
21	270	11.8					3.0	2.90
22	270	11.4					2.7	3.00
23	260	10.8						3.05

Time: 150.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 10

Puerto Rico, W. I. (18.5°N, 67.2°W)

September 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	280	9.0					(3.8)	2.80
01	270	8.6					(2.9)	2.90
02	250	8.0					(2.8)	3.00
03	230	6.9					(3.0)	2.90
04	250	6.4					(2.9)	2.70
05	260	5.9					(3.4)	2.80
06	260	5.8					(2.4)	2.85
07	240	8.6	---	---	(119)	2.3		3.20
08	230	10.0	230	---	109	3.1	3.5	3.10
09	---	10.8	225	---	109	3.5	3.6	3.00
10	(290)	11.6	220	---	109	3.8		2.85
11	(290)	12.5	220	5.6	109	4.0	4.1	2.80
12	330	12.8	215	5.7	108	4.1	4.2	2.80
13	330	13.0	220	5.9	108	4.1		2.75
14	330	12.9	230	5.8	109	4.0	5.2	2.75
15	320	12.9	230	5.5	109	3.8	5.3	2.75
16	---	12.4	230	---	109	3.5	4.8	2.80
17	250	11.6	240	---	111	3.0	4.6	2.80
18	250	11.1	---	---	---	<2.2	3.4	2.80
19	240	10.3					3.2	2.80
20	250	9.4					3.5	2.75
21	270	9.2					3.2	2.70
22	280	9.1					(3.6)	2.70
23	280	9.0					(4.0)	2.75

Time: 60.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 11

Panama Canal Zone (9.4°N, 79.9°W)

September 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	10.0						3.05
01	230	9.0					2.2	3.10
02	230	6.8					1.9	3.10
03	230	6.2						2.80
04	250	5.4						2.90
05	260	4.5					2.7	2.75
06	280	5.1					3.2	2.80
07	240	8.6			112	2.6	3.6	3.10
08	230	10.2	230	---	109	3.2	4.4	2.90
09	(280)	12.0	225	---	105	3.7	4.6	2.80
10	(310)	13.0	220	---	107	4.0	4.6	2.75
11	340	13.8	220	---	105	4.1	4.4	2.70
12	360	14.3	220	---	107	4.2	4.9	2.65
13	370	14.5	220	---	109	4.2		2.70
14	360	14.8	230	---	107	4.1	5.4	2.65
15	350	14.5	235	---	105	3.9	5.5	2.70
16	330	14.0	230	---	107	3.4	5.4	2.70
17	310	13.1	240	---	110	2.8	4.8	2.75
18	260	13.0			---	---	4.1	2.75
19	270	12.3					4.4	2.80
20	260	12.3					3.6	2.80
21	250	11.8					3.1	2.80
22	250	10.8					2.8	2.80
23	260	10.6						2.90

Time: 75.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 12

Thule, Greenland (77.0°N, 69.0°W)

August 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00		(5.6)			---	---		2.80
01		5.6			<131	(2.0)		2.80
02		5.8			131	2.1		2.80
03		5.3	---		121	2.2		2.85
04		5.6	---		120	2.4		2.85
05		5.5	(3.9)		115	2.5		2.70
06		5.6			4.0	111	2.7	2.85
07		5.8			4.2	110	2.9	2.80
08		5.6	(4.3)		111	3.0		2.65
09		5.8			4.5	110	3.0	3.6
10		5.7			4.5	105	3.1	2.45
11		6.0			4.5	105	3.1	2.65
12		5.6			4.6	109	3.2	2.60
13		5.8			4.6	105	3.1	3.3
14		5.8			4.4	105	3.1	2.60
15		5.9	(4.4)		107	3.0		2.70
16		6.0	(4.4)		107	2.9		2.65
17		5.8			4.2	111	2.8	2.60
18		6.0	(4.0)		115	2.6		2.75
19		5.8	(3.8)		119	2.5		2.70
20		6.0	---		<129	2.2		2.75
21		5.8			<137	2.0		2.75
22		5.8			<136	2.0		2.95
23		5.6			<140	2.0		2.85

Time: 75.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 13

Narsarssuak, Greenland (61.2°N, 45.4°W) August 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00		(5.1)					4.8	(2.80)
01		---					4.5	----
02		---					4.3	----
03		(4.1)					4.0	(2.70)
04		4.5			---	---	3.9	2.90
05		5.2			121	2.0	4.0	3.00
06		5.8			112	2.6		3.00
07		6.1			111	2.9		3.00
08		6.4			4.6	109	3.2	2.95
09		6.7			(4.8)	108	(3.3)	2.90
10		6.5			5.0	103	3.3	2.80
11		6.8			5.0	107	3.5	2.70
12		7.0			5.2	109	3.5	2.70
13		7.0			5.1	104	(3.5)	2.65
14		7.2			5.0	109	(3.3)	2.75
15		7.2			4.9	109	3.3	2.70
16		6.8			4.8	111	3.2	2.75
17		6.5			4.5	111	3.0	2.85
18		(6.2)			4.2	117	2.0	(2.85)
19		(6.0)			---	121	2.8	2.9
20		(5.4)			---	---	---	4.5
21		(4.8)			---	---	---	7.0
22		---			---	---	---	4.6
23		---			---	---	---	4.6

Time: 45.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 14

Upsala, Sweden (59.8°N, 17.6°E) August 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	295	5.5					2.7	2.7
01	305	5.2					3.1	2.7
02	305	4.8					3.0	2.7
03	305	4.6					2.9	2.8
04	300	4.8	290	2.80	---	E	2.7	2.9
05	295	5.4	255	(3.30)	130	1.95	3.1	2.9
06	310	6.0	245	4.00	115	2.50	4.4	2.9
07	320	6.5	240	4.60	110	2.90	5.0	2.9
08	340	7.2	240	4.80	105	3.10	5.6	2.8
09	340	7.3	230	5.10	105	3.30	5.6	2.9
10	345	7.6	230	5.20	105	3.40	6.0	2.85
11	360	7.6	220	5.30	105	3.50	4.7	2.9
12	350	7.8	220	5.30	105	3.50	5.7	2.8
13	350	7.8	225	5.30	105	3.50	4.6	2.9
14	345	7.5	225	5.20	105	3.50	4.6	2.9
15	360	7.4	230	5.20	105	3.30	4.0	2.8
16	340	7.3	240	4.95	105	3.10	3.7	2.9
17	300	7.4	245	4.50	110	2.85	3.6	2.9
18	290	7.6	250	(3.80)	115	2.40	3.9	2.9
19	260	7.6	260	(3.30)	135	1.80	3.4	2.9
20	255	7.5			---	E	3.4	2.9
21	260	7.1			---	E	2.9	2.9
22	265	6.8			---	---	2.5	2.8
23	290	6.0			---	---	2.5	2.7

Time: 15.0°E.

Sweep: 1.4 Mc to 17.0 Mc in 6 minutes, automatic operation.

Table 15

Adak, Alaska (51.9°N, 176.6°W) August 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	<300	5.6						2.65
01	<310	(5.3)						(2.60)
02	320	5.0						(2.55)
03	320	4.1						2.50
04	320	4.2					1.1	2.55
05	<330	5.2	270	---	130	---	2.2	2.60
06	400	6.0	250	3.9	113	(2.5)	3.0	2.60
07	380	6.8	230	4.3	109	(2.9)	3.9	2.60
08	360	7.4	220	4.7	107	---	4.4	2.70
09	390	7.6	220	4.9	105	---	4.3	2.70
10	410	7.4	220	5.0	104	---	4.1	2.70
11	380	7.0	<220	5.2	(107)	---	4.4	2.70
12	<390	7.2	210	5.4	111	---	4.3	2.70
13	390	7.3	220	5.4	112	3.7	4.0	2.65
14	390	7.3	220	5.2	111	3.7	3.8	2.80
15	400	7.4	220	5.0	107	(3.5)		2.80
16	350	7.5	230	---	107	(3.2)		2.90
17	320	7.2	240	---	110	2.8	3.3	2.90
18	260	7.3	250	---	121	(2.2)	3.7	2.95
19	260	7.4					3.6	2.95
20	260	7.1					2.7	2.90
21	260	6.6					2.5	2.80
22	270	6.4					2.5	2.75
23	<290	5.9						2.70

Time: 180.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 27 seconds.

Table 16

San Francisco, California (37.4°N, 122.2°W) August 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	<300	5.2					3.0	2.60
01	280	(5.1)					2.6	(2.60)
02	280	5.0					3.0	2.60
03	(280)	4.9					2.9	(2.60)
04	<280	4.6					2.8	2.60
05	300	4.3					3.1	2.65
06	270	5.5	260	---	(115)	(2.2)	3.5	2.80
07	320	6.8	235	(4.3)	(107)	(2.8)	4.0	2.80
08	340	7.3	220	(4.9)	(105)	(3.2)	4.4	2.65
09	360	8.6	<210	(5.1)	(105)	(3.4)	4.6	2.65
10	360	8.6	205	(5.3)	(105)	(3.6)	4.4	2.60
11	360	9.2	210	(5.6)	(105)	(3.8)	4.2	2.60
12	360	9.4	200	(5.6)	(107)	(3.9)	4.0	2.60
13	360	9.6	210	(5.6)	(107)	(3.9)	3.9	2.60
14	350	9.4	220	(5.5)	(107)	(3.8)		2.65
15	340	9.0	220	(5.3)	(105)	(3.6)	4.4	2.70
16	330	8.7	220	(5.1)	(105)	(3.3)	4.1	2.75
17	320	8.2	230	(4.7)	(109)	(3.0)	4.1	2.85
18	260	7.8	245	---	(111)	(2.3)	3.5	2.90
19	250	7.4			---	---	3.1	2.95
20	240	6.8					3.0	2.80
21	250	6.2					3.0	2.80
22	260	5.8					3.7	2.75
23	270	5.4					3.3	2.60

Time: 120.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 17

Maui, Hawaii (20.8°N, 156.5°W) August 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	9.1						2.80
01	280	8.5						2.85
02	250	8.1						3.00
03	250	6.7						2.90
04	250	6.0						2.90
05	260	5.4						2.80
06	290	5.4	---	---			2.0	2.70
07	260	7.0	240	---	116	2.5	3.3	3.00
08	250	8.0	225	---	109	3.1	3.8	2.95
09	340	8.9	210	(5.4)	109	3.5	4.4	2.60
10	390	10.0	210	5.8	109	3.8	4.5	2.45
11	400	10.8	210	5.8	110	4.0	4.6	2.50
12	390	11.5	215	6.0	111	4.0	4.5	2.60
13	380	11.8	220	5.9	111	4.1	4.3	2.70
14	370	12.4	220	5.8	111	4.0	4.4	2.70
15	350	12.6	220	5.6	111	3.8	4.4	2.75
16	320	12.6	230	5.4	111	3.5	5.0	2.85
17	300	12.2	240	4.9	110	3.1	4.6	2.90
18	260	11.4	245	---	117	2.4	4.8	2.95
19	260	10.5					4.1	2.90
20	270	10.0					4.5	2.80
21	280	9.9					2.8	2.75
22	280	9.6					2.4	2.70
23	300	9.4					2.5	2.75

Time: 150.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 18

Fairbanks, Alaska (64.9°N, 147.0°W) July 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00		(5.0)					4.7	(2.90)
01		(5.0)					4.4	(2.70)
02		(4.9)					4.3	(2.80)
03		(5.1)			116	---	5.6	(2.70)
04		(5.2)			109	---	4.6	(2.75)
05		(5.6)			4.0	105	2.6	(2.60)
06		(6.0)			4.2	102	2.8	(2.65)
07		(5.8)			4.4	101	(3.0)	4.5
08		5.8			4.5	101	(3.2)	3.9
09		6.1			4.6	101	(3.3)	4.0
10		5.8			4.6	101	(3.4)	3.9
11		5.8			4.7	101	3.4	3.7
12		5.8			4.8	102	(3.4)	3.9
13		6.0			4.8	103	3.4	4.1
14		6.0			4.8	103	3.4	3.6
15		5.8			4.6	103	3.3	3.8
16		5.8			4.7	103	(3.2)	2.65
17		5.8			(4.5)	105	3.0	3.7
18		5.8			(4.2)	111	2.7	3.2
19		(5.9)			---	111	2.5	3.5
20		(5.5)			---	119	(2.2)	4.1
21		(5.0)			---	122	---	4.0
22		(5.0)			---	---	---	4.0
23		(5.0)			---	---	---	4.3

Time: 150.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.



Table 19

San Francisco, California (37.4°N, 122.2°W)

July 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	<300	5.2					3.8	2.60
01	---	(5.0)					3.8	(2.55)
02	---	(4.9)					3.1	(2.60)
03	<280	(4.8)					3.3	(2.65)
04	<280	(4.6)					3.0	(2.60)
05	<290	4.6	300	---	---	---	3.0	2.70
06	340	5.5	250	(3.6)	<115	(2.3)	3.8	2.75
07	410	6.4	230	(4.3)	(105)	(2.8)	4.1	2.70
08	400	7.2	215	(4.8)	(105)	(3.2)	4.4	2.55
09	400	7.6	<210	(4.9)	(105)	(3.5)	4.6	2.55
10	400	7.8	200	(5.0)	(105)	(3.6)	4.3	2.50
11	400	8.0	205	(5.1)	(105)	(3.8)	4.8	2.55
12	400	7.8	200	(5.2)	(107)	(3.8)	4.4	2.60
13	390	8.2	<215	(5.2)	<107	(3.8)	4.8	2.60
14	380	8.0	215	(5.1)	(105)	(3.7)	4.3	2.65
15	380	7.7	220	(5.0)	(105)	(3.6)	4.4	2.70
16	380	7.4	220	(4.8)	(107)	(3.4)	4.1	2.70
17	340	7.0	(225)	(4.6)	(109)	(3.1)	4.2	2.80
18	300	7.0	<240	(4.1)	(109)	(2.5)	4.0	2.85
19	<270	6.9	(260)	---	---	---	3.6	2.95
20	240	6.9					4.2	(2.90)
21	(250)	6.4					3.6	2.80
22	<260	5.6					4.4	2.75
23	---	5.2					3.7	2.65

Time: 120.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 20

Point Barrow, Alaska (71.3°N, 156.8°W)

June 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00		5.2		---	---	---	4.1	2.85
01		5.4		---	---	---	5.2	2.80
02		(5.0)		---	---	---	3.4	(2.75)
03		(4.8)		---	---	---	4.3	(2.80)
04		4.8		(3.9)	101	2.2	3.7	(2.70)
05		(4.7)		(3.7)	101	2.5	3.0	(2.55)
06		(4.8)		(4.0)	101	2.7	3.3	(2.50)
07		(4.9)		(4.0)	101	3.1	3.4	---
08		(5.4)		(4.4)	---	---	3.8	---
09		(5.1)		(4.3)	---	---	4.0	(2.50)
10		(5.5)		(4.6)	---	---	3.8	(2.50)
11		(5.6)		(4.5)	---	---	2.9	(2.50)
12		(5.8)		(4.6)	---	---	---	(2.55)
13		(5.7)		4.7	99	---	---	2.50
14		(6.0)		4.8	---	---	---	(2.50)
15		(6.0)		(4.7)	101	---	---	2.70
16		5.9		(4.6)	101	(3.2)	---	2.55
17		5.9		(4.5)	101	3.0	---	2.65
18		5.8		(4.3)	101	2.9	---	2.60
19		5.4		4.1	101	2.7	---	2.65
20		5.5		---	103	2.6	---	2.75
21		5.4		---	110	2.2	3.2	2.85
22		5.6		---	---	---	3.9	2.85
23		5.4		---	---	---	4.0	2.80

Time: 150.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 21

Upsala, Sweden (59.8°N, 17.6°E)

June 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	5.9					2.4	2.7
01	290	5.7					2.5	2.7
02	300	5.6					2.8	2.7
03	330	5.6	280	2.90	---	---	1.60	3.0
04	340	5.8	250	3.60	115	2.05	3.1	2.7
05	370	5.8	240	4.00	110	2.45	3.6	2.7
06	385	6.0	230	4.50	105	2.80	5.0	2.7
07	390	6.4	225	4.70	105	3.00	4.6	2.7
08	380	6.8	220	4.85	100	3.20	5.2	2.8
09	390	6.8	215	5.00	100	3.35	5.6	2.7
10	380	6.9	215	5.10	100	3.40	5.6	2.7
11	390	6.9	210	5.20	100	3.45	5.1	2.7
12	405	6.8	210	5.20	100	3.50	5.6	2.7
13	410	6.6	210	5.15	100	3.45	4.3	2.7
14	395	6.6	210	5.15	100	3.45	3.6	2.7
15	390	6.7	215	5.00	100	3.40	4.3	2.8
16	380	6.6	220	5.00	105	3.20	3.7	2.7
17	355	6.6	240	4.70	105	3.00	3.8	2.8
18	320	6.7	240	4.30	105	2.70	4.0	2.9
19	290	6.6	250	3.75	110	2.35	3.8	2.9
20	275	6.7	260	3.20	130	1.90	3.0	2.9
21	270	6.6					E	2.4
22	275	6.8					E	2.4
23	285	6.1						2.2

Time: 15.0°E.

Sweep: 1.4 Mc to 17.0 Mc in 6 minutes, automatic operation.

Table 22

Godhavn, Greenland (69.2°N, 53.5°W)

May 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00		(5.1)			---	---	---	(2.80)
01		(5.2)			---	---	---	(2.70)
02		(5.2)			---	119	---	(2.80)
03		(4.5)		(2.9)	(123)	---	---	(2.70)
04		(4.4)		3.3	117	(1.9)	---	(2.55)
05		(5.1)		(3.6)	109	2.2	---	(2.75)
06		(4.8)		3.8	109	2.5	---	(2.60)
07		(5.0)		4.0	107	2.8	---	(2.50)
08		(5.4)		(4.3)	105	3.0	---	2.60
09		(5.8)		(4.5)	105	3.2	---	(2.60)
10		(6.2)		4.6	104	3.3	---	(2.70)
11		(6.4)		4.6	103	3.3	---	(2.55)
12		(6.6)		(4.6)	103	3.3	---	(2.65)
13		(6.4)		(4.6)	102	3.3	---	2.65
14		(5.8)		(4.6)	103	3.2	---	(2.65)
15		(5.8)		4.6	103	3.2	3.3	2.60
16		5.8		(4.5)	105	3.0	3.4	2.70
17		(5.7)		4.4	107	2.9	3.9	(2.65)
18		(6.1)		4.2	107	2.7	3.9	2.70
19		(5.9)		3.8	109	2.4	2.7	(2.70)
20		5.7		3.6	109	2.1	2.7	2.80
21		5.6		---	115	1.9	---	2.80
22		5.6		---	113	(1.5)	---	2.75
23		(5.2)		---	---	---	---	2.75

Time: 45.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 16.2 seconds.

Table 23

Godhavn, Greenland (69.2°N, 53.5°W)

April 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00		(5.4)						(2.60)
01		(4.9)						(2.60)
02		(4.3)						(2.60)
03		4.0						(2.55)
04		4.0						2.60
05		(4.2)						2.80
06		(4.6)		3.2	113	(2.2)		2.90
07		(4.8)		(3.5)	109	2.5		(3.00)
08		(6.0)		(4.0)	109	(2.7)		---
09		(6.0)		4.2	109	3.0		(2.70)
10		6.5		(4.4)	109	(3.2)		2.50
11		(7.2)		(4.5)	109	3.2		(2.60)
12		(6.9)		(4.6)	109	3.2		(2.50)
13		(6.6)		4.6	109	3.2		(2.50)
14		(6.5)		4.5	109	3.1		2.55
15		(6.6)		4.3	109	3.0		(2.60)
16		(6.2)		4.3	109	2.8		(2.70)
17		(6.4)		4.2	111	2.6	3.3	2.70
18		6.6		3.8	111	2.4	2.7	2.70
19		(6.4)		---	116	2.1	2.2	(2.70)
20		(6.1)		---	---	1.8	2.0	2.70
21		(5.8)		---	---	---	---	2.70
22		(5.6)						(2.70)
23		5.6						2.70

Time: 45.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 16.2 seconds.

Table 24

Christchurch, New Zealand (43.6°S, 172.8°E)

April 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00		(280)	5.8					2.7
01		280	5.8					2.65
02		280	5.7					2.7
03		280	5.5					2.7
04		270	5.0					2.75
05		260	4.9					2.8
06		260	4.8				1.2	2.9
07		250	6.6	---	---	1.8	1.6	3.1
08		240	9.1	250	---	---	---	3.2
09		250	10.6	230	4.3	2.9	---	3.2
10		260	11.4	230	4.7	3.2	---	3.1
11		250	12.0	220	4.7	3.4	---	3.15
12		250	12.1	230	4.8	3.5	---	3.0
13		250	11.9	230	4.7	3.4	---	3.0
14		250	11.8	230	4.7	3.3	---	3.0
15		260	11.6	240	4.2	3.0	---	3.0
16		250	11.3	250	3.7	2.6	---	3.0
17		240	10.6	---	---	1.8	---	2.9
18		240	9.6					2.9
19		240	8.8					2.8
20		260	7.8					2.7
21		260	7.2					2.7
22		280	6.7					2.8
23		280	6.2					2.7

Time: 172.5°E.

Sweep: 1.0 Mc to 13.0 Mc in 1 minute 55 seconds.

Table 25\*

Falkland Is. (51.7°S, 57.8°W)								April 1956
Time	h°F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	350	5.1					2.2	2.3
01	350	5.0					2.2	2.3
02	350	4.8					3.1	2.3
03	345	4.8					1.8	2.3
04	340	4.6					2.0	2.3
05	345	4.5						2.4
06	320	4.8						2.6
07	245	7.1			150	1.8		3.0
08	225	9.2	(250)		125	2.3	3.2	3.1
09	230	11.8	235		115	2.8	4.3	3.1
10	230	13.0	235		110	3.0	4.9	3.1
11	250	13.3	225		105	3.1	4.9	3.1
12	245	12.9	230		110	3.2	4.8	3.1
13	235	11.9	230		105	3.1	4.0	3.1
14	230	11.8	230		110	3.0	4.8	3.1
15	230	10.8			120	2.7	4.7	3.1
16	235	10.3			130	2.4	4.6	3.2
17	230	9.2				(1.8)	3.4	3.2
18	230	8.0					3.0	3.2
19	230	6.0					2.1	3.1
20	250	5.4						2.9
21	275	4.8					2.1	2.7
22	335	4.9						2.4
23	350	5.1						2.4

Time: 60.0°W.

Sweep: 0.67 Mc to 25.0 Mc in 5 minutes.

\*Average values except foF2 and fEs, which are median values.

Table 27\*

Inverness, Scotland (57.4°N, 4.2°W)								March 1956
Time	h°F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	335	4.7						(2.4)
01	335	(4.4)						(2.5)
02	330	(4.7)						(2.5)
03	335	4.4						(2.5)
04	315	4.0						(2.5)
05	305	3.6						(2.5)
06	285	4.2			(135)	(1.5)		2.7
07	260	5.2			135	1.9		2.9
08	250	6.0			120	2.3		2.9
09	245	7.3	(230)		115	2.7		2.9
10	245	7.9	225	(3.7)	110	2.9		2.9
11	245	8.1	220	3.7	110	3.0		2.9
12	255	8.9	220	(3.8)	110	3.1		2.9
13	245	9.8	230		110	3.2		2.8
14	250	10.0	230		110	3.1		2.9
15	245	9.8	(240)		110	3.0		2.9
16	245	9.6			115	2.7		2.9
17	245	9.6			120	2.3		2.9
18	245	8.7			140	1.8		2.9
19	245	7.7						2.8
20	260	6.8						2.7
21	275	6.2						2.7
22	310	5.0						(2.5)
23	345	4.9						(2.5)

Time: 0.0°.

Sweep: 0.67 Mc to 25.0 Mc in 5 minutes.

\*Average values except foF2 and fEs, which are median values.

Table 29

San Francisco, California (37.4°N, 122.2°W)								March 1956
Time	h°F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	<280	4.9					(2.4)	2.60
01	<280	(4.8)					2.4	(2.60)
02	<280	(4.5)					2.2	(2.60)
03	<270	(4.6)					(2.2)	(2.65)
04	<280	(4.4)					2.4	(2.65)
05	<270	(4.2)						(2.60)
06	<280	(4.8)					(2.8)	(2.80)
07	240	7.2	235	---	117	(2.2)	2.7	(3.15)
08	240	(9.0)	225	(3.5)	109	(2.7)	3.4	(3.10)
09	240	10.0	215	(4.5)	107	(3.0)	3.3	3.00
10	250	10.6	210	(4.5)	107	(3.3)	3.5	2.90
11	270	11.1	205	(4.8)	108	(3.3)	3.4	2.90
12	270	11.6	210	(5.0)	111	(3.6)	3.7	2.90
13	280	12.0	<220	(4.9)	111	(3.6)		2.80
14	270	11.6	215	(4.9)	111	(3.5)		2.80
15	260	11.6	225	(4.6)	109	(3.4)		2.80
16	240	11.4	230	---	111	(3.1)	3.3	2.85
17	240	(11.0)	240	---	111	(2.5)	2.9	(2.90)
18	230	10.2	---	---	---	---	2.0	3.00
19	220	8.5	---	---	---	---	2.4	3.00
20	220	(7.3)	---	---	---	---	(2.3)	(2.95)
21	230	5.9	---	---	---	---	2.6	2.90
22	240	(5.2)	---	---	---	---	2.6	(2.80)
23	260	(4.7)	---	---	---	---	2.4	(2.60)

Time: 120.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 13.5 seconds.

Table 26

Godhavn, Greenland (69.2°N, 53.5°W)								March 1956
Time	h°F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00		(5.1)						(2.70)
01		(4.7)						(2.85)
02		(4.6)						(2.70)
03		(4.3)						(2.75)
04		(3.7)						(2.70)
05		(3.7)						(2.70)
06		(3.8)						(2.80)
07		(4.3)			115	1.9		(2.90)
08		(4.7)		(3.3)	117	2.2		(3.00)
09		(6.0)		---	115	2.5		(3.00)
10		(6.3)		3.8	113	2.7		(2.90)
11		(7.2)		4.1	112	2.8		(2.80)
12		(7.7)		(4.1)	111	2.9		(2.75)
13		(7.8)		(4.0)	113	2.9		(3.00)
14		(6.8)		4.2	113	2.8		(2.90)
15		(6.8)		4.0	113	2.7		(2.80)
16		(6.8)		3.9	114	2.4		(2.85)
17		(6.5)		---	119	2.2		(3.00)
18		(6.1)		---	123	(2.2)		(2.90)
19		(6.7)		---	---	---		(2.85)
20		(7.0)		---	---	---		(2.70)
21		(6.0)		---	---	---		(2.75)
22		(6.5)		---	---	---		(2.80)
23		(5.6)		---	---	---		(2.70)

Time: 45.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 16.2 seconds.

Table 28

Slough, England (51.5°N, 0.6°W)								March 1956
Time	h°F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	330	5.0						2.45
01	320	4.9					2.2	2.45
02	325	4.7					2.4	2.45
03	315	4.4					2.4	2.5
04	300	4.2					2.3	2.55
05	290	3.6					2.5	2.6
06	280	4.4			155	1.6	2.9	2.75
07	270	6.4	255	3.7	130	2.1	3.2	3.0
08	265	7.7	235	4.1	120	2.6	3.2	2.95
09	270	9.0	230	4.2	115	3.0	3.0	2.90
10	265	9.9	230	4.4	115	3.2	2.6	3.0
11	265	10.5	225	4.6	115	3.4		2.8
12	265	10.8	225	4.7	115	3.5		2.8
13	270	10.8	225	4.7	115	3.5		2.85
14	255	10.7	230	4.4	115	3.4		2.85
15	250	10.2	235	4.2	115	3.2		2.85
16	250	10.0	240	3.9	120	2.9	2.5	2.9
17	245	9.6	245	4.1	125	2.3	3.2	2.95
18	240	9.3			135	1.8	2.6	2.9
19	240	8.5						2.8
20	250	7.4						2.75
21	270	6.5						2.6
22	290	6.0						2.45
23	330	5.4						2.4

Time: 0.0°.

Sweep: 0.55 Mc to 16.5 Mc in 5 minutes.

\*Average values except foF2 and fEs, which are median values.

Table 30\*

Singapore, British Malaya (1.3°N, 103.8°E)								March 1956
Time	h°F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	215	11.0						(2.8)
01	230	9.5						2.8
02	245	9.0						2.9
03	240	8.4						3.0
04	230	7.3						3.0
05	230	5.4					1.6	3.1
06	260	5.2			(135)	1.2	2.4	2.8
07	250	9.0			135	2.5	3.4	3.0
08		11.1	245		115	3.2	4.0	2.8
09		12.5	230		110	3.6	4.4	2.5
10		12.6	215		110	3.8	3.9	2.3
11		12.8	210		110	4.0	4.2	2.1
12		12.7	205		110	4.1		2.1
13		12.9	205		110	4.0		2.2
14		12.9	215		110	3.9	4.2	2.2
15		13.1	215		110	3.7	4.4	2.1
16		13.6	230		110	3.3	4.5	2.2
17	250	13.7			115	2.8	4.4	2.2
18	280	13.6			(140)	2.0	3.4	(2.2)
19	360	(12.6)					2.8	---
20	355	>12.1						---
21	280	(12.0)					2.2	---
22	240	(12.6)					2.9	---
23	220	(12.0)						(2.9)

Time: 105.0°E.

Sweep: 0.67 Mc to 25.0 Mc in 5 minutes.

\*Average values except foF2 and fEs, which are median values.

Table 31

Christchurch, New Zealand (43.6°S, 172.8°E)

March 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	290	6.2					2.6	
01	280	6.0					2.4	
02	290	5.7					1.8	
03	290	5.5					2.6	
04	280	4.9					2.7	
05	280	4.3					1.7	
06	270	4.8	---	---		1.7	2.95	
07	250	6.6	250	---		2.2	3.0	
08	280	7.9	240	4.4		2.8	3.0	
09	260	8.7	240	4.5		3.1	3.1	
10	280	10.0	230	4.8		3.3	2.9	
11	(270)	10.7	230	5.0		3.4	2.9	
12	(310)	10.8	230	5.2		3.5	2.9	
13	300	10.4	230	5.0		3.5	2.9	
14	300	10.4	240	5.0		3.5	2.85	
15	(280)	9.8	240	4.6		3.3	2.9	
16	280	9.9	250	4.5		2.9	2.9	
17	260	9.7	260	---		2.5	2.9	
18	260	9.5	---	---		1.8	2.9	
19	250	9.0				---	2.9	
20	270	8.3					2.8	
21	270	7.8					2.7	
22	280	7.1					2.65	
23	280	6.6					2.6	

Time: 172.5°E.

Sweep: 1.0 Mc to 13.0 Mc in 1 minute 55 seconds.

Table 33

Godhavn, Greenland (69.2°N, 53.5°W)

January 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00		(3.2)					2.7	(3.10)
01		(2.8)					2.9	(2.85)
02		(2.8)					3.3	(2.90)
03		(2.7)					3.1	---
04		(3.0)					3.1	---
05		---					3.5	---
06		---					3.4	---
07		---					4.0	---
08		(3.2)					---	---
09		(3.3)					3.4	---
10		(4.7)			---	---	2.9	---
11		(5.5)			---	---	2.5	---
12		(4.6)			---	---	3.1	---
13		(5.1)			---	---	3.3	---
14		(5.1)			---	---	2.0	(3.00)
15		(4.4)			---	---	3.3	(3.00)
16		(4.3)			---	---	4.6	---
17		(4.4)			---	---	3.4	---
18		(4.5)					3.5	---
19		(4.6)					4.0	(3.00)
20		(4.3)					4.0	---
21		(4.2)					4.5	---
22		(3.5)					3.9	---
23		(3.6)					3.5	---

Time: 45.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 16.2 seconds.

Table 35\*

Ibadan, Nigeria (7.4°N, 4.0°E)

November 1955

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	246	(8.9)					6.6	(3.1)
01	246	(7.6)					4.0	---
02	243	(7.2)					4.8	---
03	244	6.2					4.8	---
04	236	(4.8)					4.0	(3.2)
05	238	3.4					4.1	(3.2)
06	250	6.7	---	---	132	1.9	4.8	(3.1)
07	---	9.1	227	---	118	2.7	8.8	3.0
08	---	10.2	212	---	116	3.1	10.4	2.7
09	---	10.2	210	---	110	3.3	11.2	2.5
10	---	9.5	207	---	111	3.5	11.2	2.4
11	---	9.5	205	---	111	3.6	11.2	2.5
12	---	9.6	202	---	111	3.6	11.2	2.5
13	---	10.0	198	---	111	3.5	10.9	2.4
14	---	10.4	202	---	111	3.3	10.9	2.4
15	---	10.5	205	---	113	3.1	10.9	2.4
16	---	10.4	223	---	120	2.6	10.7	2.4
17	265	(10.4)	---	---	132	2.0	8.8	---
18	335	9.2	---	---	---	---	5.2	2.2
19	341	8.6	---	---	---	---	4.0	(2.3)
20	312	9.2					4.3	(2.6)
21	265	(10.1)					4.6	---
22	252	(8.8)					6.5	---
23	244	(9.2)					6.0	---

Time: 0.0°.

Sweep: 0.67 Mc to 25.0 Mc in 5 minutes.

\*Average values except foF2 and fEs, which are median values.

Table 32

Godhavn, Greenland (69.2°N, 53.5°W)

February 1956

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00		(3.7)						(2.80)
01		(3.7)						(2.90)
02		(3.4)						(2.90)
03		(3.5)						(2.85)
04		(3.5)						(2.95)
05		(3.4)					2.0	---
06		(3.4)					1.7	---
07		---					3.0	---
08		---					2.5	---
09		(4.7)			---	---	---	---
10		(6.3)			---	---	---	---
11		(6.5)			---	119	(2.20)	(3.20)
12		(6.5)			---	---	(2.30)	(3.10)
13		5.9			---	---	(2.50)	---
14		(5.8)			---	(125)	(2.40)	(3.00)
15		(6.0)			---	---	---	(2.90)
16		(5.8)			---	---	---	(3.10)
17		(5.5)			---	---	---	(3.10)
18		(4.9)			---	---	---	(3.00)
19		(5.5)			---	---	---	(2.90)
20		(4.5)			---	---	---	(2.90)
21		(5.2)			---	---	---	(2.90)
22		(5.0)			---	---	---	(2.85)
23		(4.6)			---	---	---	(2.90)

Time: 45.0°W.

Sweep: 1.0 Mc to 25.0 Mc in 16.2 seconds.

Table 34\*

Ibadan, Nigeria (7.4°N, 4.0°E)

December 1955

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	246	8.5					2.4	(3.0)
01	252	7.7					3.0	(3.0)
02	260	(7.2)					1.7	3.0
03	252	6.5					1.7	(3.0)
04	238	(5.4)					1.3	(3.1)
05	227	4.5					3.8	(3.3)
06	253	(5.6)			135	(1.64)	4.3	---
07	263	8.7	233	---	125	2.23	6.8	2.9
08	290	9.8	222	---	118	2.95	10.2	2.5
09	311	10.0	210	---	112	3.27	10.9	2.4
10	(319)	9.9	206	---	111	3.50	13.4	2.3
11	340	9.7	203	(5.23)	110	3.58	13.7	2.3
12	356	9.6	201	(5.15)	110	3.59	13.4	2.2
13	344	10.1	202	(5.04)	111	3.60	13.4	2.2
14	348	10.2	199	---	111	3.50	13.3	2.2
15	(338)	10.2	205	---	113	3.24	12.0	2.2
16		10.1	216	---	113	2.94	10.1	2.2
17	277	9.9	(237)	---	119	(2.33)	6.7	2.2
18	305	9.6	---	---	---	---	3.8	2.2
19	354	8.8					2.5	2.2
20	366	(8.0)					1.4	(2.2)
21	308	(9.0)					3.5	---
22	285	(9.6)					2.3	(2.5)
23	260	(9.6)					3.0	---

Time: 0.0°.

Sweep: 0.67 Mc to 25.0 Mc in 5 minutes.

\*Average values except foF2 and fEs, which are median values.

Table 36

Lulea, Sweden (65.6°N, 22.1°E)

May 1955

Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	260	---						
01								
02	260	(3.1)					2.0	
03								
04	245	3.8	220	3.4	110	1.8	2.5	
05								
06	310	4.5	210	3.7	100	2.3		
07								
08	325	5.1	200	4.0	100	2.6		
09								
10	335	5.3	215	4.1	100	2.5		
11								
12	330	5.4	210	4.3	100	2.6		
13								
14	320	5.0	200	4.2	100	2.5		
15								
16	310	5.0	210	3.8	100	2.6		
17								
18	270	5.0	230	3.5	110	2.2		
19								
20	240	(4.8)			---	1.6	2.0	
21								
22	260	---						
23								

Time: 15.0°E.

Sweep: 1.5 Mc to 10.0 Mc in 6 minutes, automatic operation.

Table 37

Tananarive, Madagascar (18.8°S, 47.8°E)								September 1954
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	220	3.5					1.6	3.34
01	215	3.1					1.8	3.39
02	205	2.5					1.6	3.42
03	<250	2.1					1.8	2.96
04	260	2.1					2.0	3.00
05	260	2.2					2.6	3.04
06	235	3.4			<141	1.40	2.0	3.28
07	250	4.9	230	----	111	2.00	2.8	3.47
08	285	5.8	230	3.95	105	2.60		3.28
09	295	6.6	220	4.15	105	2.95		3.18
10	280	7.9	210	4.30	104	3.15		3.24
11	265	8.0	210	4.35	103	3.20		3.26
12	270	7.2	200	4.40	101	3.25		3.36
13	280	6.8	195	4.30	103	3.20		3.30
14	275	6.5	195	4.20	103	3.10		3.31
15	270	6.2	200	4.00	103	2.90		3.32
16	250	5.7	210	3.75	104	2.60	3.0	3.41
17	240	5.4	230	----	113	2.15	3.1	3.39
18	230	4.7			---	1.35	2.6	3.30
19	230	4.4					2.6	3.16
20	230	4.0					1.8	3.15
21	240	3.5					1.7	3.08
22	260	3.4					1.6	3.00
23	240	3.5					1.7	3.16

Time: Local.

Sweep: 1.25 Mc to 20.0 Mc in 10 minutes, automatic operation.

Table 39

Djibouti, French Somaliland (11.5°N, 43.1°E)								September 1953
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	315	4.4					2.0	2.74
01	280	4.2						2.98
02	270	4.0						3.13
03	250	3.6						3.34
04	245	2.6						3.30
05	260	2.4						3.09
06	(250)	6.3	235	----	132	2.20	3.1	3.46
07	280	7.4	230	----	117	2.70	3.7	3.26
08	320	8.0	215	4.45	111	3.05	4.2	2.91
09	340	8.2	220	4.55	---	3.40	6.6	2.60
10	350	7.8	210	4.60	---	----	6.7	2.54
11	360	8.0	200	----	---	3.50	6.7	2.54
12	370	8.3	210	4.60	---	3.50	6.6	2.62
13	350	9.1	220	4.55	---	3.45	5.6	2.66
14	335	10.0	220	4.50	---	3.30	4.0	2.80
15	315	10.7	220	4.40	---	3.00	4.0	2.86
16	290	10.8	230	----	---	2.60	4.2	(3.07)
17	(265)	>10.0	250	----	---	----	3.8	3.02
18	250	9.6					2.8	3.03
19	255	8.6						2.86
20	260	7.6						2.99
21	260	6.8					2.7	2.95
22	305	5.7					2.7	2.74
23	335	4.8					2.1	2.66

Time: 35.6°E.

Sweep: 1.25 Mc to 20.0 Mc in 10 minutes, automatic operation.

Table 38

Tananarive, Madagascar (18.8°S, 47.8°E)								August 1954
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000)F2
00	225	3.0					1.7	3.27
01	220	2.7					3.2	3.38
02	230	2.5					2.4	3.26
03	<220	2.3					2.7	3.29
04	<240	1.8					1.8	3.16
05	<260	1.9					2.6	3.10
06	245	2.4				152	1.05	1.7
07	---	4.4	235	----	125	1.75	1.9	3.53
08	255	5.0	235	3.80	179	2.40	3.0	3.50
09	285	5.3	220	4.00	106	2.75	3.2	3.34
10	285	5.7	220	4.15	105	2.95	3.4	3.34
11	280	5.9	200	4.25	105	3.15	3.5	3.34
12	290	6.0	210	4.30	105	3.20	3.5	3.37
13	280	5.7	205	4.25	105	3.15	3.5	3.44
14	290	5.7	200	4.10	105	3.05	3.1	3.43
15	270	5.4	210	3.90	105	2.90	3.0	3.44
16	250	5.4	220	3.55	105	2.55	3.2	3.53
17	230	4.9			119	2.05	3.0	3.56
18	220	4.2			---	----	3.1	3.43
19	220	3.8					2.0	3.30
20	225	3.2					1.9	3.23
21	240	3.1					2.3	3.10
22	245	3.3					1.8	3.17
23	240	3.1					1.8	3.22

Time: Local.

Sweep: 1.25 Mc to 20.0 Mc in 10 minutes, automatic operation.

Table 40

Leopoldville, Belgian Congo (4.4°S, 15.2°E)								September 1952
Time	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M2000)F2
00	235	4.7					2.0	2.3
01	250	4.3					2.1	2.2
02	260	4.0					1.8	2.2
03	250	3.3					1.8	2.4
04	230	2.8					2.0	2.6
05	240	4.7	240	---	---	---	2.6	2.7
06	240	6.6	230	---	115	2.4	3.4	2.7
07	270	7.9	220	---	110	3.0	4.0	2.6
08	280	8.1	220	4.4	110	3.2	4.4	2.5
09	300	9.0	210	4.6	110	3.4	4.7	2.4
10	320	9.4	210	4.7	110	3.6	4.7	2.2
11	330	10.2	200	4.7	110	3.6	4.6	2.1
12	330	11.2	200	4.8	110	3.6	4.0	2.1
13	350	11.5	225	4.4	110	3.3	4.2	2.1
14	350	12.0	250	4.4	110	3.1	4.0	<2.1
15	325	12.3	240	---	110	2.8	3.4	2.1
16	300	12.8	250	---	115	2.2	3.0	2.2
17	250	>13.3					2.6	2.3
18	240	13.2					2.6	<2.4
19	230	>13.0					2.2	<2.5
20	210	12.2						2.6
21	205	9.0						2.6
22	205	7.9						2.5
23	220	6.7						2.4

Time: 0.0°.

Sweep: 1.0 Mc to 16.0 Mc in 7 seconds.



TABLE 41  
IONOSPHERIC DATA

foF2, O.I Mc, Oct. 1956

75° W Mean Time

Station: Washington, D.C. Lat. 38.7°N Long. 77.1°W Sweep 1.0 Mc to 25.0 Mc in 13.5 sec. Manual ☐ Automatic ☒

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
01	F 67	F 68	70	67	58	53	58	84	102	111	120	119	120	125	125	118	111	112	100	91	82	76	76	76	
02	77	67	56	49	45	40	55	86	107	102	117	117	125	127	119	115	109	110	106	92	76	71	71	71	
03	F 68	F 63	F 57	F 56	F 47	45	54	90	107	115	125	122	125	125	124	126	126	122	106	90	85	75	70	72	
04	71	68	61	53	49	47	58	91	114	115	124	121	125	125	122	121	124	118	113	95	85	76	71	70	
05	70	68	68	55	43	37	51	86	106	115	116	120	128	127	126	120	118	118	110	93	76	74	74	71	
06	F 70	72	73	65	59	55	60	86	114	120	120	120	129	133	128	116	120	120	106	94	85	81	69	70	
07	70	67	67	60	59	54	58	88	103	113	120	120	125	126	120	121	118	117	113	93	83	75	70	72	
08	67	61	57	59	57	56	61	86	96	107	117	119	119	116	115	115	110	107	98	91	76	68	68	64	
09	U F 63	U F 62	U F 60	U F 55	U F 44	U F 42	U F 49	85	91	108	115	116	123	123	123	123	120	115	108	93	84	72	70	69	
10	F 69	F 68	F 61	F 57	F 53	F 49	F 58	90	107	115	124	127	130	125	126	125	120	116	108	90	86	84	70	70	
11	63	64	65	60	54	48	54	87	112	115	118	128	125	126	124	125	123	115	108	86	84	80	76	72	
12	F 68	U F 67	U F 64	F 62	F 58	F 55	F 58	84	110	120	125	126	125	125	126	126	126	120	110	92	86	80	79	71	
13	64	64	61	58	56	56	59	91	112	121	129	130	129	130	130	129	126	122	110	92	86	78	77	74	
14	70	67	64	64	60	55	60	90	110	119	128	130	128	130	128	130	128	119	107	95	88	82	75	70	
15	68	68	64	56	52	49	53	90	112	119	123	124	125	125	125	126	125	118	109	90	87	80	76	72	
16	70	72	66	59	55	51	58	92	113	125	126	125	126	133	130	129	130	121	108	90	84	80	72	72	
17	F 66	F 66	F 66	F 66	F 63	F 55	F 56	86	104	118	126	130	134	132	130	130	129	122	113	95	79	75	67	61	
18	U F 60	U F 61	U F 63	U F 63	U F 62	U F 58	U F 55	87	112	124	130	130	133	135	131	128	130	124	94	90	81	79	76	72	
19	63	63	61	62	63	62	65	90	112	126	130	135	133	133	133	133	132	120	109	95	87	79	72	72	
20	F 66	F 62	F 55	F 54	F 56	F 49	F 51	72	92	98	109	125	125	125	130	130	131	128	115	96	90	76	73	74	
21	75	70	70	64	56	56	56	75	114	129	133	130	125	120	118	120	113	108	100	86	71	65	56	50	
22	U F 58	U F 56	U F 56	U F 47	U F 38	U F 36	U F 42	80	107	122	125	130	135	135	135	132	125	118	105	93	90	83	78	71	
23	69	71	69	66	66	62	58	82	105	124	135	135	136	140	136	134	126	118	104	94	83	86	77	66	
24	59	59	60	55	52	49	43	78	107	125	130	130	135	130	133	128	127	117	105	90	76	72	69	63	
25	64	60	60	52	50	45	48	78	110	123	127	130	130	131	128	125	123	114	96	88	77	69	65	64	
26	F 63	F 64	F 60	F 60	F 58	F 53	F 49	80	110	126	123	123	130	125	124	119	119	116	110	95	78	68	72	60	
27	68	68	70	70	63	55	54	82	105	130	142	145	140	140	136	133	130	125	115	89	75	70	66	63	
28	F 63	F 59	F 50	F 48	F 43	F 47	F 42	70	94	105	115	127	134	130	128	125	120	118	107	96	79	68	58	57	
29	57	58	56	51	48	42	42	72	102	122	126	132	132	130	133	128	128	120	108	92	80	76	70	63	
30	63	61	58	53	49	48	50	88	103	122	126	135	136	130	134	130	128	120	108	96	80	69	64	60	
31	59	55	56	52	49	44	44	76	105	122	130	131	130	130	130	130	124	116	105	90	77	76	74	73	
MED	67	64	61	58	55	49	55	86	107	120	125	127	129	130	128	126	125	118	108	92	83	76	71	70	
NO	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	

CENTRAL RADIO PROPAGATION LABORATORY, NATIONAL BUREAU OF STANDARDS, BOULDER, COLO.

TABLE 42  
IONOSPHERIC DATA

foF2, 0.1 Mc, Oct. 1956

75° W Mean Time

Station: Washington, D.C. Lat. 38.7°N Lang. 77.1°W Sweep 1.0 Mc to 25.0 Mc in 13.5 sec. Manual ☐ Automatic ☒

	0030	0130	0230	0330	0430	0530	0630	0730	0830	0930	1030	1130	1230	1330	1430	1530	1630	1730	1830	1930	2030	2130	2230	2330	
01	70	69	70	63	55	50	69	98	107	118	120	118	125	125	123	115	110	110	97	84	78	76	73	78	
02	74	57	54	47	43	42	65	105	102	113	108	125	127	120	115	111	113	110	98	82	68	71	71	71	
03	71	63	56	49	44	47	76	100	117	122	120	122	130	125	123	126	125	117	94	88	77	72	72	72	
04	68	64	58	50	47	49	76	110	116	117	121	125	126	127	121	121	120	115	105	88	83	76	71	70	
05	68	69	64	48	38	44	68	99	115	115	120	124	127	126	124	118	120	112	103	86	75	72	72	72	
06	72	74	72	63	58	54	74	100	120	120	125	127	133	130	124	121	120	116	100	88	84	71	68	73	
07	69	66	63	62	56	53	70	98	110	119	119	120	126	125	123	123	118	114	99	89	77	69	70	71	
08	62	59	58	59	55	53	75	94	102	111	118	118	118	115	116	114	107	105	96	82	72	69	68	64	
09	62	62	58	50	44	42	70	96	103	114	118	122	123	130	125	121	120	113	100	87	80	70	72	69	
10	68	62	59	55	50	49	72	106	111	120	126	128	127	125	126	122	120	113	96	90	86	76	72	67	
11	60	64	63	57	48	47	70	104	115	118	123	127	125	125	125	123	120	112	96	86	84	76	74	72	
12	68	66	62	62	56	52	72	100	120	125	119	123	126	136	125	128	125	116	96	90	83	82	77	69	
13	65	64	60	56	56	50	77	102	118	126	127	130	129	129	129	127	127	119	100	90	84	69	71	72	
14	69	66	63	62	59	54	77	103	120	120	127	125	130	130	130	130	125	116	94	95	83	79	70	70	
15	68	64	63	53	49	48	69	105	114	120	125	125	129	125	127	125	125	117	96	92	84	80	72	70	
16	72	71	60	57	50	52	73	103	123	125	120	129	133	130	128	130	126	120	96	87	84	76	70	69	
17	66	66	65	67	57	52	68	95	114	122	129	130	133	132	133	129	127	118	103	88	77	69	64	58	
18	62	62	62	63	62	52	70	100	118	125	131	130	134	134	132	130	130	114	92	85	81	78	74	68	
19	62	61	62	64	63	59	76	104	118	128	135	134	132	133	133	134	124	114	98	90	80	78	74	70	
20	62	55	55	53	57	49	63	83	102	109	118	127	125	128	127	132	130	118	105	97	84	74	77	75	
21	74	69	68	61	58	52	66	98	124	130	133	130	122	118	120	117	114	106	94	78	69	58	55	50	
22	55	58	50	40	37	33	58	99	113	124	130	135	135	135	134	130	121	116	104	94	87	82	74	70	
23	70	70	67	66	65	60	79	98	114	142	136	138	140	140	140	133	123	112	98	84	85	82	72	66	
24	58	59	59	55	50	42	60	96	115	130	136	133	137	132	133	127	130	107	98	80	70	69	67	63	
25	60	60	60	52	45	44	62	95	121	127	126	128	130	131	125	123	121	106	90	83	73	69	64	64	
26	64	60	58	59	56	50	63	99	116	134	120	125	125	125	122	119	119	117	105	93	72	72	60	60	
27	69	71	72	64	62	60	63	96	121	140	144	142	140	136	133	131	133	120	103	82	72	67	67	58	
28	59	56	52	44	45	43	58	80	98	112	120	135	133	130	125	125	106	113	99	82	72	62	59	57	
29	57	57	55	48	45	38	54	90	112	128	130	130	132	130	125	130	125	116	98	85	78	74	64	62	
30	64	60	57	50	48	47	63	100	121	128	128	135	138	135	133	132	125	115	102	90	73	67	64	60	
31	58	57	53	50	47	42	58	94	115	126	125	131	130	130	130	126	118	113	94	87	77	72	74	68	
MED	66	63	60	56	50	49	69	99	115	122	125	128	130	130	125	126	121	114	98	87	78	72	71	69	
NO	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	

CENTRAL RADIO PROPAGATION LABORATORY, NATIONAL BUREAU OF STANDARDS, BOULDER, COLO.



TABLE 43  
IONOSPHERIC DATA

foF1, O.I Mc, Oct.1956

75° W Meon Time

Station: Washington, D.C. Lat. 38.7°N Long. 77.1°W Sweep 1.0 Mc to 25.0 Mc in 13.5 sec. Manual ☐ Automatic ☒

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
01								Q	L	L	L	L	L	L	L	L	L	L						
02								Q	L	L	L	L	L	L	L	L	L	Q						
03								Q	L	L	L	L	L	L	L	L	L	L						
04								Q	Q	L	L	L	L	L	L	L	L	L						
05								Q	L	L	L	L	L	L	L	L	L	Q						
06								L	L	L	L	L	L	L	L	L	L	Q						
07								Q	Q	L	L	L	L	L	L	L	L	Q						
08								Q	L	L	L	L	L	L	L	L	Q	Q						
09								Q	L	L	L	L	L	L	L	L	L	Q						
10								Q	L	L	L	L	L	L	L	L	L	L						
11								Q	L	L	L	L	L	L	L	L	L	L						
12								Q	L	L	L	L	L	L	L	L	L	Q						
13								Q	L	L	L	L	L	L	L	L	L	Q						
14								L	L	L	L	L	L	L	L	L	L	L						
15								Q	L	L	L	L	L	L	L	L	L	Q						
16								Q	Q	L	L	L	L	L	L	L	L	Q						
17								Q	L	L	L	L	L	L	L	L	L	Q						
18								Q	L	L	L	L	L	L	C	L	L	Q						
19								Q	L	L	L	L	L	L	L	L	Q	Q						
20								Q	L	L	L	L	L	L	L	L	L	L						
21								L	L	L	L	L	L	L	L	L	L	Q						
22								Q	Q	L	L	L	L	L	L	C	L	Q						
23								C	Q	L	L	L	L	L	L	L	Q	Q						
24								Q	L	L	L	L	L	L	L	L	Q	Q						
25								Q	L	L	L	L	C	L	L	L	L	Q						
26								L	L	L	L	L	L	L	L	L	L	Q						
27								Q	L	L	L	L	L	L	L	L	Q	Q						
28								Q	L	L	L	L	L	L	L	L	L	Q						
29								Q	L	L	L	L	L	L	L	L	Q	Q						
30								Q	Q	Q	L	L	L	L	L	L	L	Q						
31								Q	L	L	L	L	L	L	L	L	Q	Q						
MED																								
NO																								

TABLE 44  
IONOSPHERIC DATA

faE, O.I. Mc, Oct. 1956

75° W Mean Time

Station: Washington, D.C. Lat. 38.7°N Long. 77.1°W Sweep 1.0 Mc to 25.0 Mc in 13.5 sec. Manual ☐ Automatic ☒

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
01								220	290	330	350	U R 350	360	370	350	H 340	290	220						
02								R	280	310	350	U P 350	H 350	H 350	H 330	300	230							
03								A	U A 310	I R 330	350	370	370	350	330	290	A							
04								B	300	320	I B 320	330	340	H 370	H 350	340	310	220						
05								H	H 240	330	330	U R 360	340	H 350	H 330	290	220							
06								H	220	270	A	330	H 360	H 360	I A 340	300	H 240							
07								230	290	330	340	340	330	350	340	330	290	220						
08								U B 220	I A 260	300	320	I A 340	H 340	H 340	350	330	280	220						
09								U B 220	H 280	I A 320	H 340	H 350	350	360	360	320	280	220						
10								B	H 280	H 330	H 350	H 360	H 370	H 360	350	H 330	290	H 210						
11								R	R	B	360	I A 360	370	350	320	280	A							
12								220	I C 280	H 310	H 320	H 350	A	360	350	330	H 280	H 220						
13								H	290	H 320	H 340	H 340	H 360	H 360	H 320	H 280	B							
14								U P 210	H 280	H 320	A	A	340	340	H 340	I A 320	180							
15								H	200	H 290	A 320	A 340	H 330	H 330	320	260	U B 200							
16								B	260	H 320	H 340	A	A	350	340	I A 310	200							
17								A	250	H 290	A	A	I A 350	340	310	270	A							
18								U B 190	250	290	A	A	360	H 360	I C 340	270	R							
19								R	280	A	A	A	350	I A 360	H 340	270	A							
20								190	U H 260	H 290	U P 320	H 330	340	U P 340	330	260	H 170							
21								R	260	U P 310	H 320	H 340	360	350	330	270	H 190							
22								A	A	H 320	U S 340	350	U P 360	U A 340	H 320	I C 250	B							
23								C	A	H 310	330	350	350	350	330	A	B							
24								B	A	A 320	H 330	I A 340	H 350	A	A	H 260	B							
25								180	U H 270	H 300	330	A	C	350	330	A	B							
26								U P 180	H 280	H 300	340	350	350	350	330	H 240	H 170							
27								210	H 270	H 290	320	330	350	360	U A 340	A	A							
28								R	B	I A 300	320	340	350	H 330	H 340	250	A							
29								B	A	I A 310	H 320	340	350	340	340	260	R							
30								B	U B 250	H 320	340	F 340	H 350	H 360	H 340	B								
31								B	U B 260	H 310	320	330	U B 320	H 340	U R 330	H 250	B							
MED								220	280	310	330	340	350	350	340	320	270	220						
NO								16	24	27	24	24	28	31	30	30	28	16						

TABLE 45  
IONOSPHERIC DATA

fEs, 0.1 Mc, Oct. 1956

75° W Mean Time

Station: Washington, D.C. Lat. 38.7°N Long. 77.1°W Sweep 1.0 Mc to 25.0 Mc in 13.5 sec.

Manual ☐ Automatic ☒

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
	S	S			S			G	G	G	G	G	G		G				S	S					
01		S	S	S	25		28	27	B	G				40	G	50	30	24			30	B	B	S	
02		S	S	S		27				G			G		G	G	G	39	30	47	S	S	S	S	
03		S	S	S	S	S	S	B		28	32	41	G	G	G	G	G		S	S	S	S	S	S	
04		S	S	S	S	B	B		29	23	31	33	35	35	G	39	38	G	G	23	B	S	S	B	S
05		S	S	S	S	S	S	B	G	G	G	G	G	G	G	G	G	G	S	S	S	S	S	S	
06		S	S	S	S	S	S	S	G	S	36	38	33	37		G	40	39	G	G		S	S	S	S
07		S	S	S		S	S	S		G	G			G	G	40	39	G	G	26	29		B		
08		S	S	S	30			24				35	35	34		G	G	G	G		S	S	37	27	
09		S	S	S	S	S	S	B		21	45	33	34	33	33	G	G	G	G	24		S	44	27	
10		S	S	S	S	S	S	S	G	G	G	G		G	G	G	G	G	28	30	S	S	S	23	
11		S	S	S	S	S	S	B	G	G	G	G	40		G	G	G	G	25		36	S	S	S	
12		S	S	S	25	25	S	G	G	G	G	G		38	31	29	29	G	22	S	S	S	S	S	
13		S	S	S	S	S	S	G	C	Y	G		39	39	34	G	G	G	G	S		S	S	S	
14	25	31	30	26	25	S	S	13	35	G	35	G		G	G	G	G	29	20	S	S	26	S	S	
15		S	S	60	S	S	S	G		34	39	36		G	37	36	35	37	20	S	S	S	S	40	
16		S	S	S	S	S	S	G	27	39	33	41		G	G	G	38	G	G	S	S	S	S	S	
17		S	S	S	S	S	S	G			31	35	38	33	G	G	33	35	G	S	S	S	26	S	
18		S	24	25	S	S	S	41	21	30	31	33	42		36	37	42	40	21	38	53	28	S	42	
19	39	46	44		S	S	S	S	20	28	31	40	41	40	G	C		G	G	S	S		S	S	
20		S	S	S	32	B	B	S	G	G	H	74	64	72	40	34	54	38	H	20	S	S	S	S	
21		S	26	34	S	S	S	S	G	G		49	G	G	G	G	G	26	35	G	S	S	S	S	
22		S	S		S	S	S	S	G	G	G	G	G		68	34	33	G	G	S	S	S	S	S	
23		S	E	S	S	S	S	S	42	30	G	36	G	G	35	35	C	G	B	S	S	S	S	S	
24		S	S	S	S	S	S	S	C		43	36	G	G		36	45	33	25	B	S	S	C	S	
25	24		S	S	E	S	S	S	B		40	31		60	G	34	30	25		B	B	B	S	S	
26		S	S	S	S	S	S	G	G	G	G	G		C		G	42	26	S	31	S	S	S	S	
27		S	S	S	S	S	S	G	G	G	G	G	37	37	G	G	26	G	S	S	S	S	S	33	
28		S	S	S		32	S	G	G	G	G	G		G	35	44	42	31	B	S	S	S	S	S	
29		S	S	S	35	S	S	B	G	G		32	G	G	G	G	G	38		S	S	S	S	S	
30		S	S	S	S	S	S	B		25	56	40	G	G	G	G	G	G	S	S	S	S	S	S	
31		S	S	S	B	B	S	S	B	G		29	G	G	40	27	25	34	19	B	S	B	B	B	
32		B	B	B	B	B	B	B	G	G	G	G	G	G	G		31	G	B	S	S	S	B	B	
MED		U 25	U 30	U 25						31									23	U 33	U 30			U 27	
NO	4	6	7	9	7	5	10	30	30	31	31	31	30	31	30	30	31	30	10	7	5	4	8	7	

CENTRAL RADIO PROPAGATION LABORATORY, NATIONAL BUREAU OF STANDARDS, BOULDER, COLO.

TABLE 46  
IONOSPHERIC DATA

fmin, 0.1 Mc, Oct. 1956

75° W Mean Time

Station: Washington, D.C. Lat. 38.7°N Long. 77.1°W Sweep 1.0 Mc to 25.0 Mc in 13.5 sec.

Manual ☐ Automatic ☒

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
01	E S 16	E S 14	E S 13	E S 13	E S 16	E S 16	E S 16		18	18	19	21	23	24	24	21	E S 16	20	E S 16	E S 16	E S 16	17	20	18	E S 16
02	E S 16	E S 16	E S 14	E S 13	E S 11	E S 16		20	19	20	19	20	21	24	19	20	19	E S 16	17	E S 15	E S 16	E S 16	16	13	14
03	E S 14	E S 12	E S 11	E S 13	E S 11	E S 14		17	20	23	26	26	26	22	24	22	21	17	16	E S 16	E S 16	E S 16	16	14	16
04	E S 14	E S 13	E S 13	E S 13	E S 19	E S 17	E S 16	21	21	24	34	28	24	27	24	26	20	18	17	E S 16	E S 16	E S 16	16	17	16
05	E S 15	E S 15	E S 16	E S 15	E S 17	E S 15	E S 21	E S 16		22	22	21	21	23	21	20	E S 16	18	E S 16	E S 17	E S 16	E S 16	16	16	16
06	E S 16	E S 13	E S 14	E S 14	E S 16	E S 17	E S 16	E S 17	E S 16	E S 16	21	22	24	21	20	20	E S 16	E S 16	E S 15	E S 15	E S 16	E S 16	16	16	16
07	E S 16	E S 13	E S 13	E S 12	E S 14	E S 14	E S 16	E S 16	18	21	20	23	22	19	20	20	17	E S 16	18	E S 16	E S 16	16	16	18	12
08	E S 16	E S 15	E S 16	E S 12	E S 15	E S 16	E S 18	E S 16	E S 16	21	E S 16	E S 16	21	23	22	20	E S 16	E S 16	E S 16	E S 16	E S 16	15	16	16	16
09	E S 13	E S 12	E S 13	E S 11	E S 12	E S 16	E S 16	E S 16		17	19	17	21	20	19	22	18	16	20	E S 16	E S 16	E S 16	16	15	16
10	E S 15	E S 13	E S 12	E S 13	E S 13	E S 14	E S 15	E S 24	E S 16		22	21	20	20	18	21	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	16	16	16
11	E S 16	E S 16	E S 13	E S 13	E S 12	E S 16	E S 16	18	23	25	42	24	22	21	16	E S 16	E S 16	17	20	E S 16	E S 16	E S 16	15	16	16
12	E S 16	E S 16	E S 14	E S 14	E S 16	E S 16	E S 16	17		C	18	20	22	30	24	21	E S 16	E S 17	E S 16	E S 17	E S 16	E S 16	16	15	
13	E S 16	E S 16	E S 13	E S 13	E S 19	E S 16	E S 16	E S 16	E S 16	E S 16	21	21	21	19	21	20	17	18	E S 16	E S 14	E S 16	E S 16	16	16	16
14	E S 13	E S 16	E S 16	E S 13	E S 11	E S 13	E S 16	19	18	20	19	20	21	22	17	20	E S 16	17	E S 15	E S 16	E S 16	E S 16	16	16	16
15	E S 13	E S 12	E S 12	E S 12	E S 13	E S 16	E S 16	E S 16	E S 16	E S 16	16	18	21	22	22	20	E S 16	E S 16	18	E S 16	E S 16	E S 16	15	16	16
16	E S 16	E S 16	E S 11	E S 12	E S 13	E S 16	E S 16	17	17	17	16	20	22	22	23	17	E S 16	E S 17	E S 14	E S 16	E S 16	E S 20	16	19	16
17	E S 16	E S 15	E S 16	E S 13	E S 14	E S 16	E S 16	E S 13	E S 16	17	20	21	23	23	21	20	E S 16	E S 16	E S 16	E S 15	E S 16	E S 16	16	16	16
18	E S 15	E S 16	E S 13	E S 13	E S 15	E S 16	E S 16	17	E S 16	20	20	21	18	19		E S 16	E S 16	20	E S 16	E S 16	E S 16	E S 16	16	16	16
19	E S 16	E S 16	E S 16	E S 16	E S 18	E S 19	E S 16	18	E S 16	E S 16	21	21	20	21	20	16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	16	16	16
20	E S 16	E S 16	E S 13	E S 13	E S 13	E S 16	E S 16	E S 16	E S 15	E S 16	18	22	21	21	16	17	E S 16	E S 16	E S 16	E S 15	E S 16	E S 16	16	16	16
21	E S 16	E S 14	E S 16	E S 15	E S 19	E S 12	E S 16	E S 16	20	19	22	23	21	24	20	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 17	E S 14	E S 16	16
22	E S 14	E S 14	E S 12	E S 12	E S 16	E S 16	E S 16	20	E S 18	22	21	21	18	17		C	E S 16	E S 22	E S 16	E S 11	E S 14	E S 16	16	20	
23	E S 15	E S 13	E S 16	E S 12	E S 12	E S 16	E S 16		20	E S 16	19	18	21	22	20	18	E S 16	E S 20	E S 16	E S 14	E S 17	E S 16		C	E S 16
24	E S 16	E S 16	E S 13	E S 16	E S 16	E S 16	E S 23	E S 16	E S 16	21	22	24	24	22	22	16	E S 16	E S 21	E S 18	E S 25	E S 16	E S 16	16	16	16
25	E S 16	E S 16	E S 14	E S 13	E S 16	E S 16	E S 16	E S 16	18	E S 16	12	19		C	18	18	18	E S 16	E S 21	E S 18	E S 16	E S 23	E S 16	16	16
26	E S 16	E S 16	E S 16	E S 13	E S 16	E S 19	E S 16	E S 16	E S 16	E S 16	19	21	22	21	17	19	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	16	16	16
27	E S 12	E S 11	E S 14	E S 15	E S 20	E S 17	E S 16	E S 17	20	20	21	21	21	22	21	21	E S 16	E S 16	E S 20	E S 17	E S 16	E S 16	16	16	16
28	E S 16	E S 16	E S 12	E S 14	E S 13	E S 13	E S 18	E S 16	22	22	21	25	21	20	17	23	E S 19	E S 16	E S 16	E S 16	E S 16	E S 16	16	16	16
29	E S 16	E S 11	E S 19	E S 12	E S 16	E S 15	E S 16	22	21	E S 16	22	19	17	21	20	16	E S 16	E S 16	E S 16	E S 16	E S 16	E S 16	16	16	16
30	E S 16	E S 20	E S 16	E S 20	E S 19	E S 16	E S 16	21	21	20	21	20	20	19	E S 16	E S 16	E S 16	E S 21	E S 16	E S 19	E S 18	E S 16	19	21	
31	19	19	19	18	19	21	20	22	21	22	22	25	29	24	22	20	E S 16	20	E S 16	E S 16	E S 16	E S 20	21	19	
MED																									
NO																									



TABLE 47  
IONOSPHERIC DATA

h'F2, Km, Oct. 1956

75° W Mean Time

Station: Washington, D.C. Lat. 38.7°N Long. 77.1°W Sweep 1.0 Mc to 25.0 Mc in 13.5 sec.

Manual ☐ Automatic ☒

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
01	300	280	260	250	240	260	270	240	260	250	L	L	U L	L	280	L	250	250	230	240	260	280	280	280		
02	250	250	280	260	330	360	260	230	230	240	250	250	L	L	U L	L	U L	280	250	230	250	270	270	280	270	
03	270	250	250	240	250	310	280	230	230	240	250	290	L	L	L	L	U L	260	250	220	230	250	260	280	290	
04	270	260	250	250	290	300	270	240	240	240	L	L	L	L	L	L	L	250	230	220	230	250	260	270		
05	270	280	260	260	300	240	280	240	250	240	230	260	320	L	L	L	270	240	240	220	250	270	280	290		
06	290	280	250	240	240	250	270	250	250	240	250	L	L	250	L	L	L	250	230	240	240	250	270	280		
07	270	270	260	270	250	260	270	240	240	240	260	260	280	270	290	250	280	240	240	220	240	270	270	270		
08	270	280	280	280	250	270	270	240	240	240	250	260	L	L	L	L	250	250	240	220	250	260	290	280		
09	270	260	260	250	230	290	270	240	230	250	250	L	L	L	L	L	L	230	230	220	240	250	270	260		
10	260	250	250	250	250	260	250	230	240	230	240	L	L	U L	270	260	250	250	230	230	240	250	250	250		
11	250	280	260	250	250	250	260	230	250	240	L	L	L	L	L	L	L	L	230	220	240	250	240	250		
12	250	250	250	260	250	230	240	230	240	240	250	290	L	270	L	L	L	230	220	230	240	250	250	250		
13	250	260	260	250	270	260	250	230	230	240	240	270	250	L	280	250	240	230	210	220	230	250	250	250		
14	260	260	260	250	230	240	250	240	240	240	250	250	L	L	260	250	250	U L	240	210	220	230	240	240	250	
15	250	240	240	230	230	240	250	230	240	230	240	L	L	250	L	250	260	230	220	220	230	250	240	260		
16	270	250	240	240	250	300	280	230	230	230	240	L	U L	250	L	L	L	220	210	220	240	250	250	250		
17	270	270	270	260	230	230	240	240	240	230	L	U L	240	240	250	240	250	230	220	230	230	240	250	250		
18	290	320	290	260	230	220	240	230	230	220	L	L	L	L	240	250	L	220	200	220	240	250	240	250		
19	270	280	290	280	270	260	260	230	230	230	240	240	L	L	250	250	230	220	220	230	240	250	250	260		
20	270	300	350	320	280	260	230	240	240	L	L	U L	270	280	L	L	U L	260	250	240	220	250	240	280	250	
21	270	250	260	240	300	270	310	L	250	240	260	270	270	L	300	L	L	230	220	230	240	250	270	280		
22	300	270	250	240	260	260	250	240	230	240	230	240	240	L	L	C	L	230	220	230	240	250	270	290		
23	300	270	260	240	240	250	230	220	220	250	250	L	250	260	250	240	230	220	230	240	230	250	240	240		
24	250	270	270	250	250	240	250	230	240	230	L	250	L	L	250	240	240	220	220	240	220	250	250	250		
25	270	280	270	240	240	240	240	240	250	250	250	260	C	L	260	L	260	230	220	240	240	260	260	280		
26	290	290	290	270	230	240	230	240	240	240	230	250	L	L	L	L	L	240	240	280	270	320	300	260		
27	310	240	230	240	300	300	250	260	240	250	230	240	240	240	L	240	230	230	220	200	220	230	250	280		
28	290	300	300	330	330	330	300	230	260	L	240	250	250	L	230	240	U L	250	230	220	230	230	240	240	270	
29	290	270	270	250	250	260	270	230	230	250	L	L	250	250	L	260	230	220	220	220	220	260	250	240		
30	270	270	250	260	290	290	270	240	230	230	240	250	L	L	240	240	U L	240	230	220	230	220	240	250	260	
31	260	250	250	270	270	250	260	230	240	240	L	L	250	L	L	L	240	230	230	230	240	260	260	260		
MED	270	270	260	250	250	260	260	240	240	240	240	250	250	U	250	260	250	250	230	220	230	240	250	250	260	
NO	31	31	31	31	31	31	31	30	31	29	22	19	14	9	14	13	21	30	31	31	31	31	31	31		

CENTRAL RADIO PROPAGATION LABORATORY, NATIONAL BUREAU OF STANDARDS, BOULDER, COLO.

TABLE 48  
IONOSPHERIC DATA

h'F1, Km, Oct. 1956

75° W Mean Time

Station: Washington, D.C. Lat. 38.7°N Long. 77.1°W Sweep 1.0 Mc to 25.0 Mc in 13.5 sec.

Manual ☐ Automatic ☒

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
01								Q	235	230	230	205	210	220	225	220	225	240						
02								Q	220	220	210	200	220	230	230	210	240	Q						
03								Q	230	230	225	210	230	230	230	240	240	235						
04								Q	230	210	220	220	230	240	245	240	235	Q						
05								Q	235	230	220	205	235	230	230	230	240	Q						
06								230	240	H	H	H	220	205	235	220	230	240	Q					
07								Q	Q	H	H	220	205	235	220	230	240	Q						
08								Q	235	230	205	205	205	235	215	235	Q	Q						
09								Q	230	210	205	220	215	220	220	230	240	Q						
10								Q	230	210	205	205	210	225	225	230	230	235						
11								Q	230	230	220	230	220	210	230	230	230	230						
12								Q	I C	H	H	220	215	215	225	235	240	Q						
13								Q	230	230	220	215	210	215	225	235	240	Q						
14								Q	225	220	220	205	215	220	210	220	230	Q						
15								220	220	215	210	200	220	215	230	230	240	230						
16								Q	235	220	205	200	230	220	215	230	230	Q						
17								Q	210	200	210	220	210	225	235	240	Q							
18								Q	220	215	205	210	230	230	220	230	230	Q						
19								Q	225	215	205	220	220	225	220	215	230	Q						
20								Q	235	220	220	225	220	230	230	235	Q	Q						
21								Q	230	220	215	220	230	220	230	235	245	220						
22								235	240	230	200	225	245	220	215	215	240	Q						
23								Q	Q	220	220	215	230	210	230	I C	220	Q						
24								C	Q	210	220	230	230	220	230	240	Q	Q						
25								Q	225	210	200	215	210	220	220	220	Q	Q						
26								Q	230	230	210	210	C	235	235	230	240	Q						
27								230	220	215	230	210	230	220	230	230	250	Q						
28								Q	220	210	210	220	220	220	220	230	Q	Q						
29								Q	230	220	220	220	220	215	220	230	230	Q						
30								Q	235	230	220	205	210	220	220	220	220	Q						
31								Q	Q	Q	210	220	220	220	230	230	230	Q	Q					
31								Q	225	220	220	215	230	230	230	230	Q	Q						
MED									230	220	215	215	220	220	225	230	240	235						
NO								4	25	30	31	31	30	31	31	31	24	7						



TABLE 49  
IONOSPHERIC DATA

h'E, Km, Oct. 1956

75° W Mean Time

Station: Washington, D.C. Lat. 38.7°N Long. 77.1°W Sweep 1.0 Mc to 25.0 Mc in 13.5 sec.

Manual ☐ Automatic ☒

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
01								129	111	107	105	109	109	105	101	H	111	119						
02								119	111	109	109	109	109	H	H	H	111	119						
03								A	A	A		111	111	109	111	111	111	121						
04								B			I B	113	117	111	H	H	U B							
05								H	H					111	109	119	117	119						
06								111	111	109	109	107	109	109	109	109	111	119						
07								H	115	109	109	109	H	H	H	115	115	121						
08								121	109	109	109	109	109	111	111	115	129							
09								U B	I A			A	A	H										
10								111	110	109	103			105	115	109	111	117						
11								U B		H	U A	I A					A							
12								121	109	109	105	103	101	101	109	109	109							
13								B	H	H	H	H	H											
14								105	109	109	109	109	101	109	109	109	109	119						
15								119	109	109		B	101	101	109	113	119	109						
16								I C	109	109	103	103		A	A		H	H						
17								A	H	H		H	H	H	H	107	109	109	129					
18								103	101	101	101	101	101	101	109	105	103							
19								119	109	109	101	101	101	101	101	109	111	129						
20								H	H	H		H	H	H	H	I A		B						
21								115	109	105	103	103	109	105	101	105	109							
22								U B	H	H														
23								121	109	109	101	101	109	105	109	105	111	133						
24								H									U A							
25								119	107	101	103	101	107	109	109	109	109	111						
26								U B					U A	H	I C	U A	U R							
27								127	109	101	101	101	119	101	101	109	109	129						
28								U R					I A	U A	I A	U A		A						
29								115	105	107	105	107	110	113	111	109	115							
30								115	109	105	105	105	103	109	105	109	111	119						
31												H	H				H	S						
32								125	111	103	109	109	109	105	109	111	111							
33								127	119	103	105	101	101	101	101	109	111	B						
34								C	U A									B						
35								109	109	101	103	109	109	101	109	111								
36								B	109	105	109	103	102	101	107	101	101	B						
37								H	H		A		C				A	B						
38								127	111	109	111			111	111	111								
39								129	109	105	101	101	109	109	109	109	109	S						
40								H	H								H	A						
41								119	109	105	103	105	101	107	109	111	111							
42								U B		I A				H	H		A							
43								109	111	111	110	109	103	103	101	111	121							
44								B				H												
45								111	105	109	103	103	111	109	109	111	117							
46								B	U A	H			U A	U A	U A	U A	B							
47								109	109	105	105	101	109	109	109	109	111							
48								B	H	H		U B	U B				B							
49								109	101	105	109	111	109	109	109	111	109							
50																								
51								119	109	109	105	105	109	109	109	109	111	119						
52								22	30	30	30	29	28	30	31	31	30	16						

MED

NO

TABLE 50  
IONOSPHERIC DATA

(M3000) F2, Oct. 1956

75° W Mean Time

Station: Washington, D.C. Lat. 38.7°N Long. 77.1°W Sweep 1.0 Mc to 25.0 Mc in 13.5 sec.

Manual ☐ Automatic ☒

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
01	F 270	F 285	270	285	290	280	285	320	305	305	300	290	290	280	290	290	290	295	295	285	280	260	U S 265	265
02	285	275	260	260	245	250	300	315	330	315	305	280	280	275	285	280	275	300	290	290	265	265	U S 280	315
03	F 275	F 290	F 285	F 290	F 275	F 255	280	320	310	310	300	290	285	275	265	270	280	285	300	290	270	275	270	265
04	270	280	275	275	260	270	295	330	330	310	300	285	290	290	280	280	290	290	300	305	285	300	295	285
05	285	285	295	290	U F 270	U F 250	295	325	320	310	290	290	275	285	275	280	275	285	295	280	280	U F 275	U F 270	U F 275
06	F 280	275	290	275	275	270	285	310	305	310	285	280	275	270	280	295	275	285	290	275	270	275	270	280
07	280	270	280	280	280	270	285	310	315	300	300	285	275	275	275	270	275	280	295	295	280	280	270	275
08	270	265	245	265	265	270	285	320	310	300	290	290	285	275	275	275	280	280	300	280	285	270	270	280
09	U F 290	U F 290	U F 290	U F 290	F 310	F 280	300	330	345	300	305	290	285	280	275	275	280	290	285	290	280	280	280	290
10	F 285	F 290	F 295	F 300	F 300	F 290	310	320	315	310	300	290	290	290	275	280	285	290	290	290	280	290	290	290
11	280	275	290	300	300	290	300	320	330	320	305	300	290	280	280	280	285	295	300	290	290	295	290	290
12	F 290	U F 300	U F 290	F 290	F 295	F 290	310	330		315	305	295	290	280	280	280	290	295	290	285	280	290	290	290
13	F 300	F 290	F 295	F 295	F 285	F 285	320	330	320	315	305	295	285	285	280	280	285	290	290	285	290	290	285	285
14	290	290	290	305	295	295	310	320	315	320	295	295	290	280	290	280	285	300	300	280	295	300	295	300
15	300	300	295	310	290	295	300	310	330	310	300	300	290	285	285	285	295	300	300	300	290	290	300	280
16	280	300	295	285	280	265	285	285	320	320	310	295	285	290	290	290	290	300	300	300	290	290	285	290
17	280	F 285	275	275	305	285	300	330	320	320	305	295	290	290	290	290	300	300	300	310	F 290	F 300	F 300	300
18	U F 295	U F 275	U F 280	U F 290	F 310	F 310	310	325	330	320	310	300	300	290	C	295	295	295	315	295	U S 295	U S 295	300	300
19	285	270	265	265	265	275	290	315	320	310	305	300	295	285	285	290	290	300	295	295	295	300	295	285
20	F 275	U F 270	U F 255	U F 265	U F 270	U F 290	300	320	310	290	280	275	275	265	270	270	280	275	280	270	270	260	275	280
21	280	285	285	300	260	260	270	260	310	305	300	285	275	260	260	270	280	290	310	290	285	285	270	280
22	U F 260	F 275	F 290	F 310	F 290	F 295	290	320	330	315	300	300	290	290	290	C	290	300	300	300	285	290	275	280
23	260	275	270	260	270	280	300		310	310	300	300	285	290	300	290	295	290	295	290	275	300	C	300
24	290	270	280	300	290	320	290	330	335	310	305	295	290	295	280	290	290	290	300	265	300	300	295	290
25	280	260	285	305	310	300	300	335	315	330	315	305		300	300	290	295	305	305	300	305	295	295	285
26	F 280	F 285	F 275	F 280	290	290	300	320	330	315	300	290	285	270	275	270	270	280	280	260	265	255	265	265
27	260	290	260	275	255	280	260	300	300	305	300	300	305	290	280	285	295	300	300	300	295	290	270	260
28	F 265	U F 270	F 265	F 255	F 270	F 260	265	320	330	290	300	300	300	290	290	290	290	295	290	300	295	295	280	270
29	265	285	280	300	285	270	260	310	315	310	305	290	285	280	280	285	285	295	290	295	285	290	290	270
30	270	285	290	280	270	255	280	320	310	310	290	285	295	280	275	280	290	300	290	300	295	275	280	270
31	290	285	285	285	280	290	280	270	310	310	300	290	280	280	280	285	285	290	290	285	280	280	290	285
MED	280	285	285	285	280	280	295	320	320	310	300	290	290	280	280	280	285	295	295	290	285	290	280	285
NO	31	31	31	31	31	31	31	30	30	31	31	31	30	31	30	30	31	31	31	31	31	31	30	31

CENTRAL RADIO PROPAGATION LABORATORY, NATIONAL BUREAU OF STANDARDS, BOULDER, COLO.

TABLE 51  
IONOSPHERIC DATA

(M3000) F1, Oct. 1956

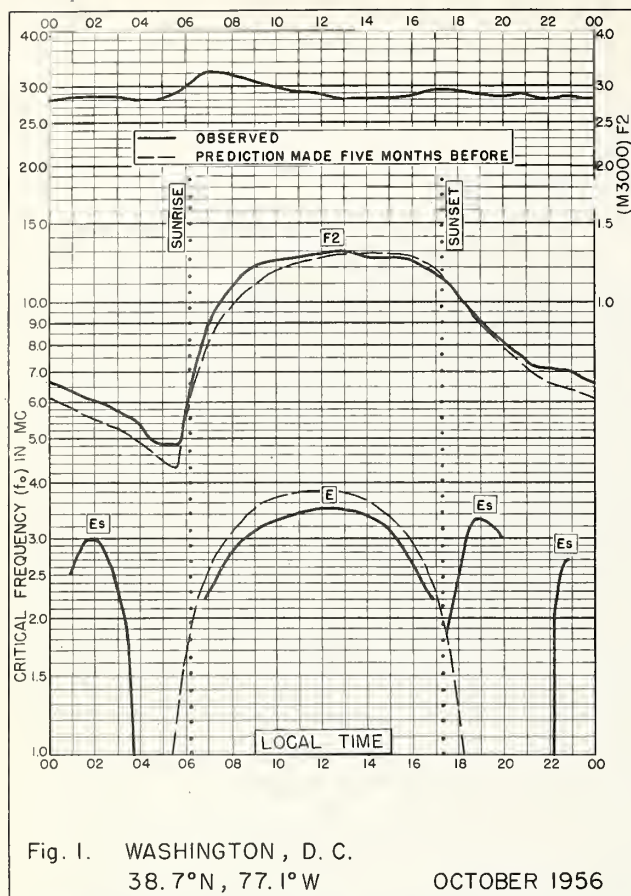
75° W Mean Time

Station: Washington, D.C. Lat. 38.7°N Long. 77.1°W Sweep 1.0 Mc to 25.0 Mc in 13.5 sec.

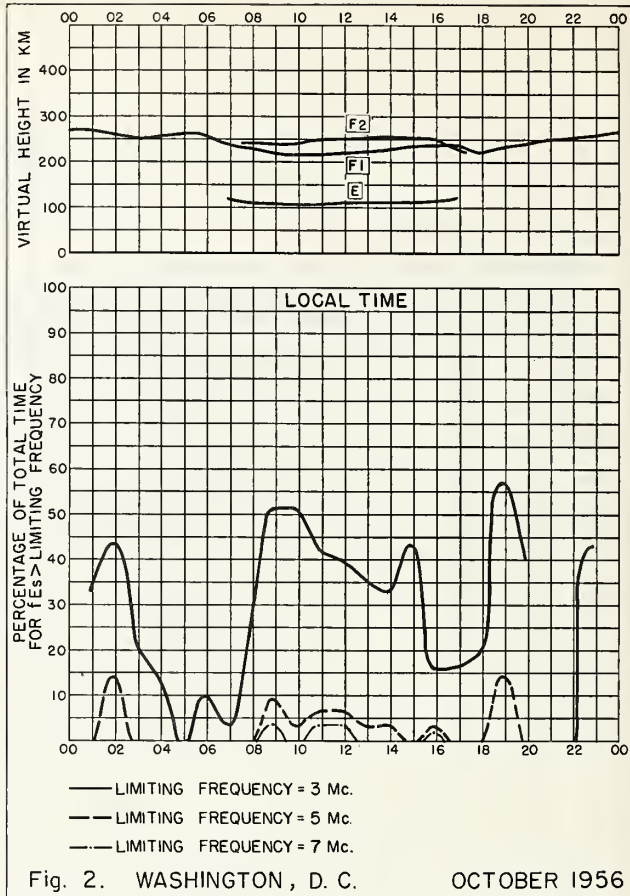
Manual ☐ Automatic ☒

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
01								Q	L	L	L	L	L	L	L	L	L	L							
02								Q	L	L	L	L	L	L	L	L	L	Q							
03								Q	L	L	L	L	L	L	L	L	L	L							
04								Q	Q	L	L	L	L	L	L	L	L	L							
05								Q	L	L	L	L	L	L	L	L	L	Q							
06								L	L	L	L	L	L	L	L	L	L	Q							
07								Q	Q	L	L	L	L	L	L	L	L	Q							
08								Q	L	L	L	L	L	L	L	L	Q	Q							
09								Q	L	L	L	L	L	L	L	L	L	Q							
10								Q	L	L	L	L	L	L	L	L	L	L							
11								Q	L	L	L	L	L	L	L	L	L	L							
12								Q	L	L	L	L	L	L	L	L	L	Q							
13								Q	L	L	L	L	L	L	L	L	L	Q							
14								L	L	L	L	L	L	L	L	L	L	L							
15								Q	L	L	L	L	L	L	L	L	L	Q							
16								Q	Q	L	L	L	L	L	L	L	L	Q							
17								Q	L	L	L	L	L	L	L	L	L	Q							
18								Q	L	L	L	L	L	L	L	L	Q	Q							
19								Q	L	L	L	L	L	L	L	L	L	L							
20								L	L	L	L	L	L	L	L	L	L	Q							
21								Q	Q	L	L	L	L	L	L	L	Q	Q							
22								C	Q	L	L	L	L	L	L	L	Q	Q							
23								Q	L	L	L	L	L	L	L	L	Q	Q							
24								Q	L	L	L	L	C	L	L	L	L	Q							
25								L	L	L	L	L	L	L	L	L	L	Q							
26								Q	L	L	L	L	L	L	L	L	Q	Q							
27								Q	L	L	L	L	L	L	L	L	L	Q							
28								Q	L	L	L	L	L	L	L	L	Q	Q							
29								Q	Q	Q	L	L	L	L	L	L	L	Q							
30								Q	L	L	L	L	L	L	L	L	Q	Q							
31																									
MED																									
NO																									



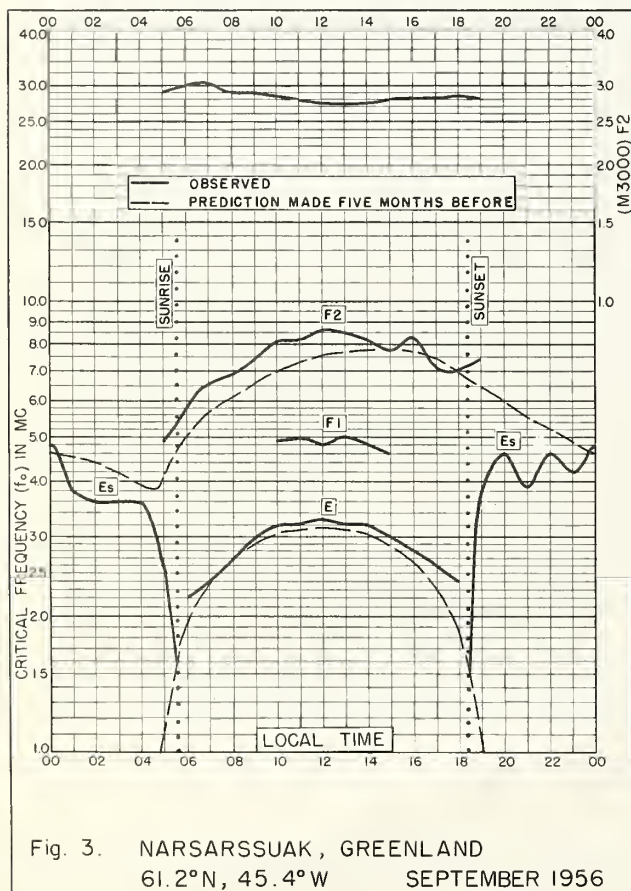


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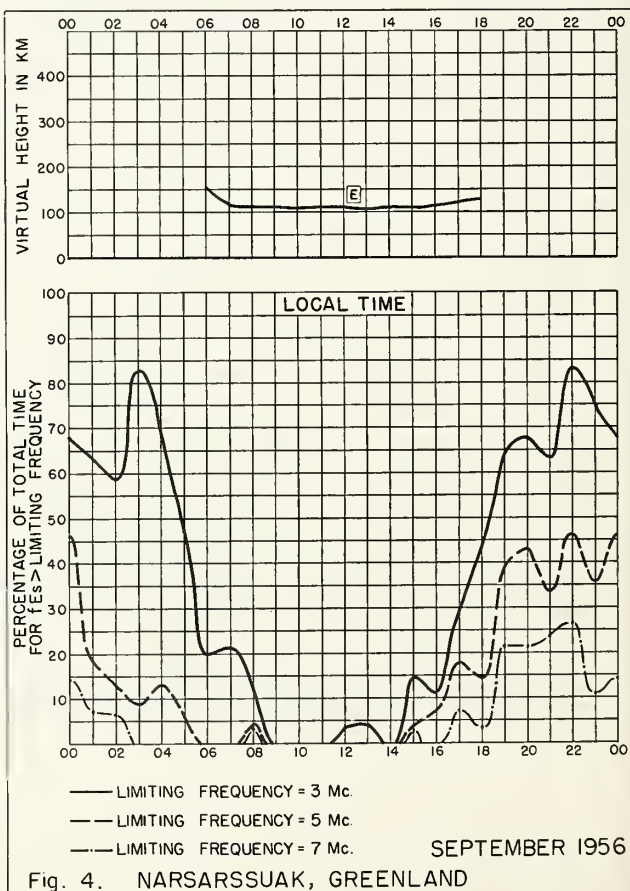


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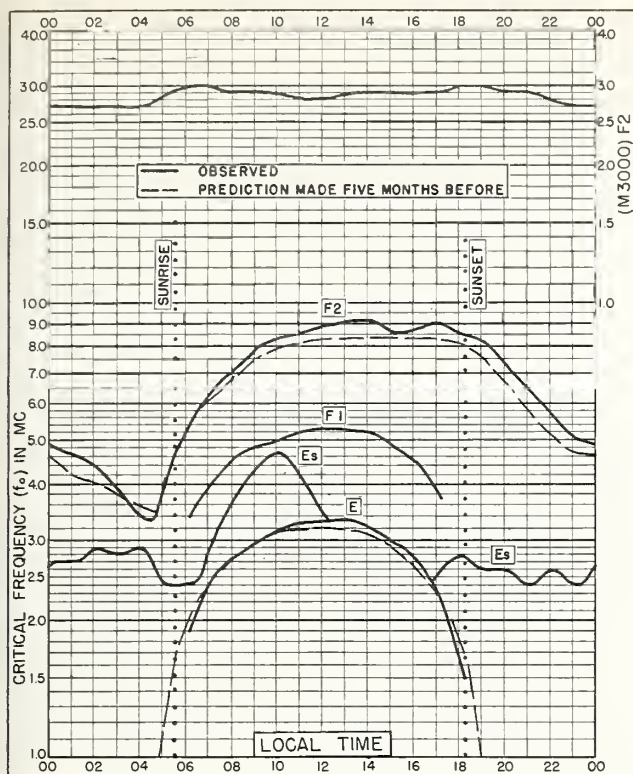


Fig. 5. UPSALA, SWEDEN  
59.8°N, 17.6°E

SEPTEMBER 1956

NBS 503

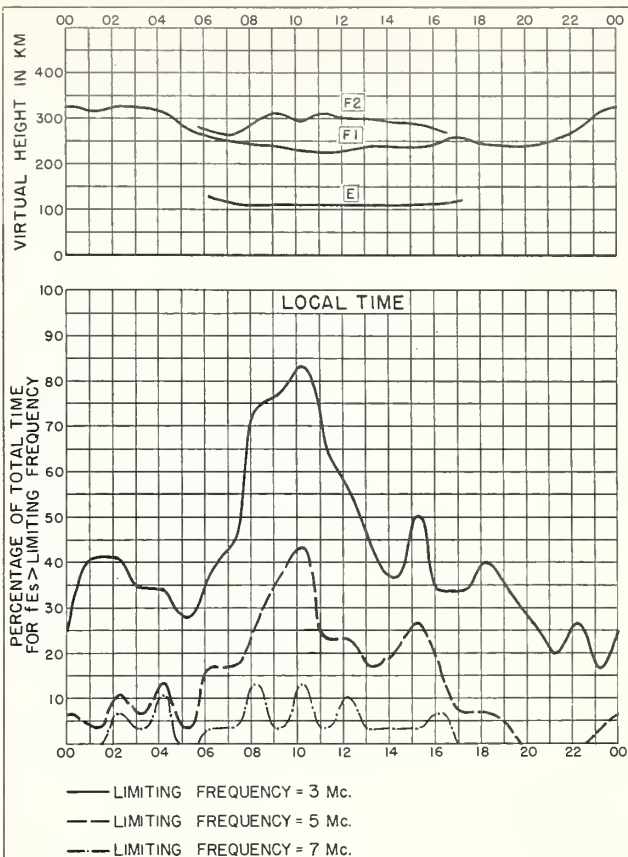


Fig. 6. UPSALA, SWEDEN

SEPTEMBER 1956

NBS 490

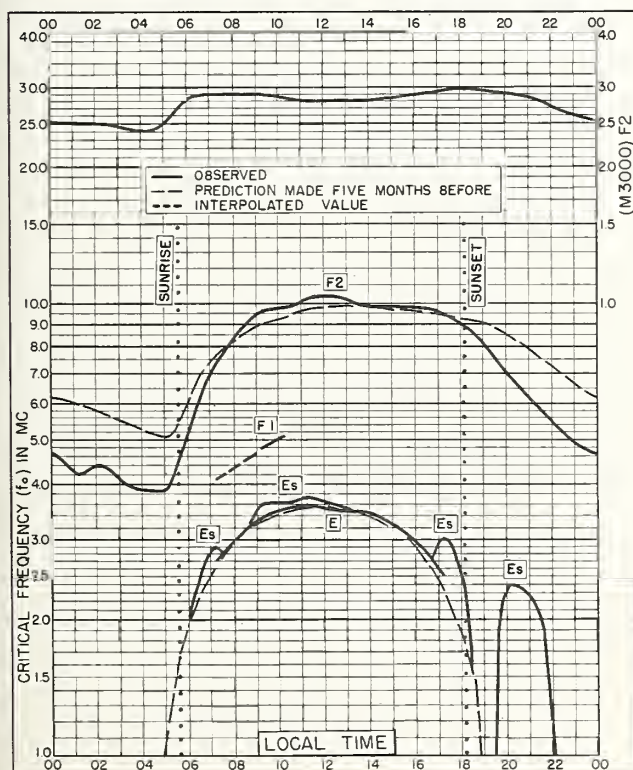


Fig. 7. ADAK, ALASKA  
51.9°N, 176.6°W

SEPTEMBER 1956

NBS 503

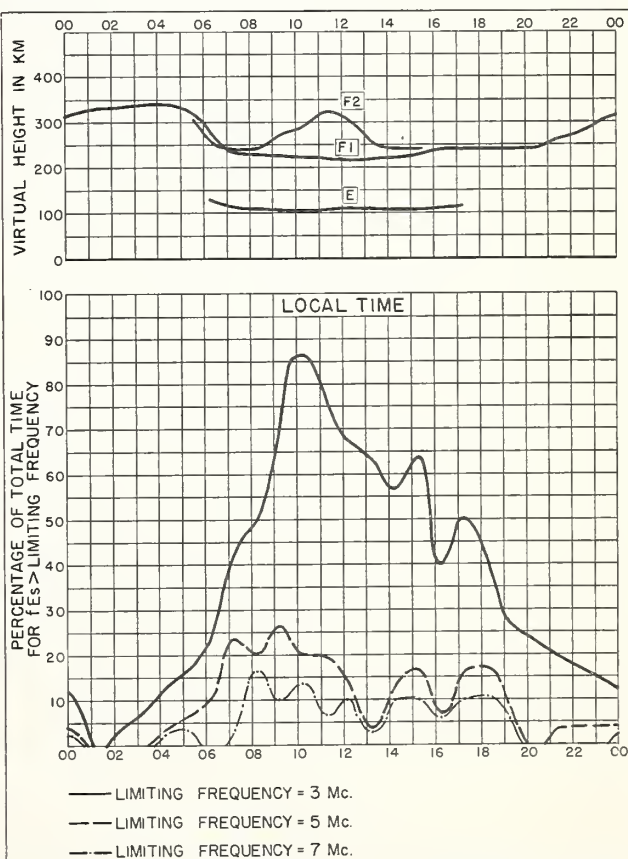


Fig. 8. ADAK, ALASKA

SEPTEMBER 1956

NBS 490

NBS 503



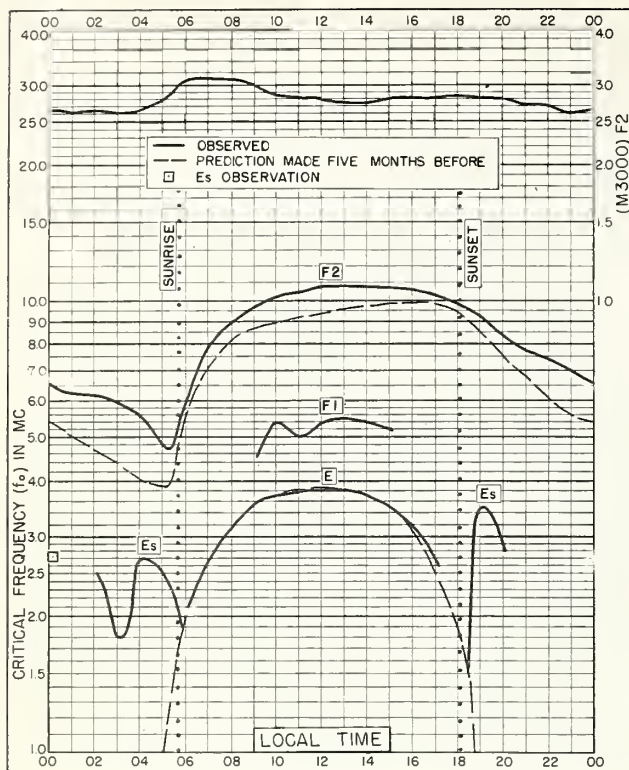


Fig. 9. FT. MONMOUTH, NEW JERSEY  
40.3°N, 74.1°W SEPTEMBER 1956

NBS 503

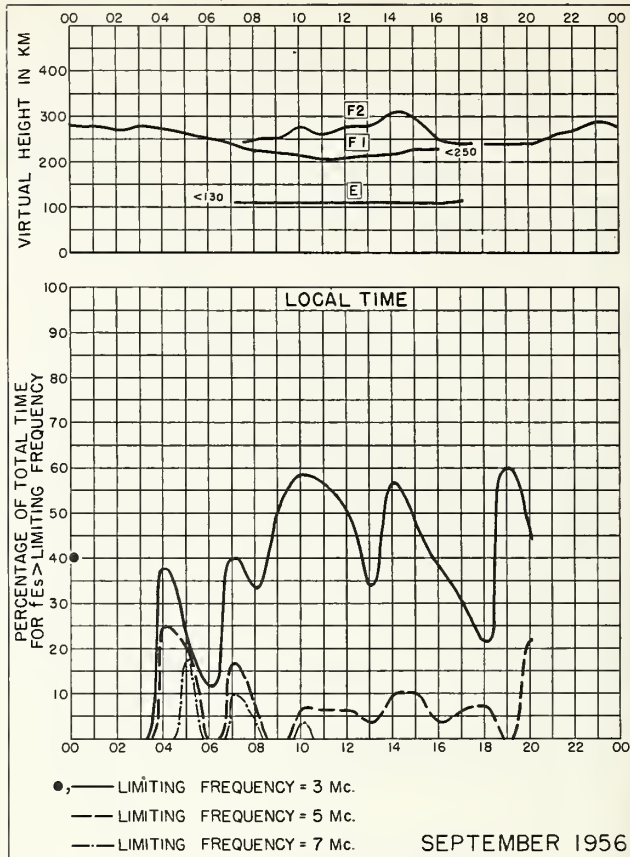


Fig. 10. FT. MONMOUTH, NEW JERSEY

NBS 490

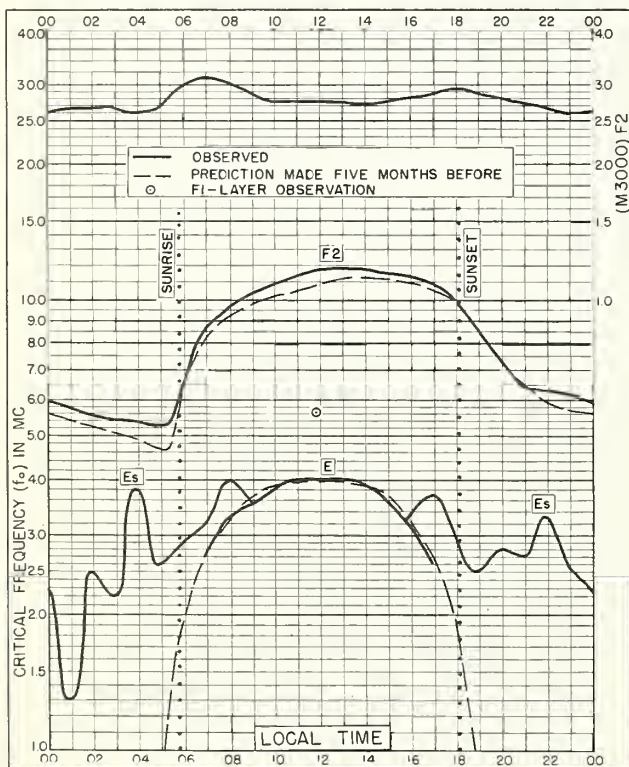


Fig. 11. WHITE SANDS, NEW MEXICO  
32.3°N, 106.5°W SEPTEMBER 1956

NBS 503

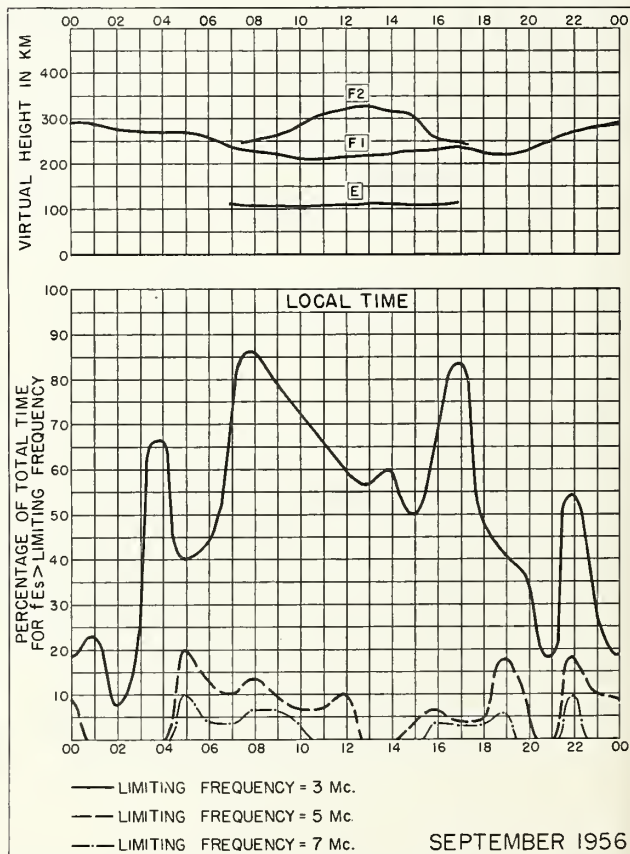


Fig. 12. WHITE SANDS, NEW MEXICO

NBS 490

N. S. INTERNATIONAL RESEARCH OFFICE 31207



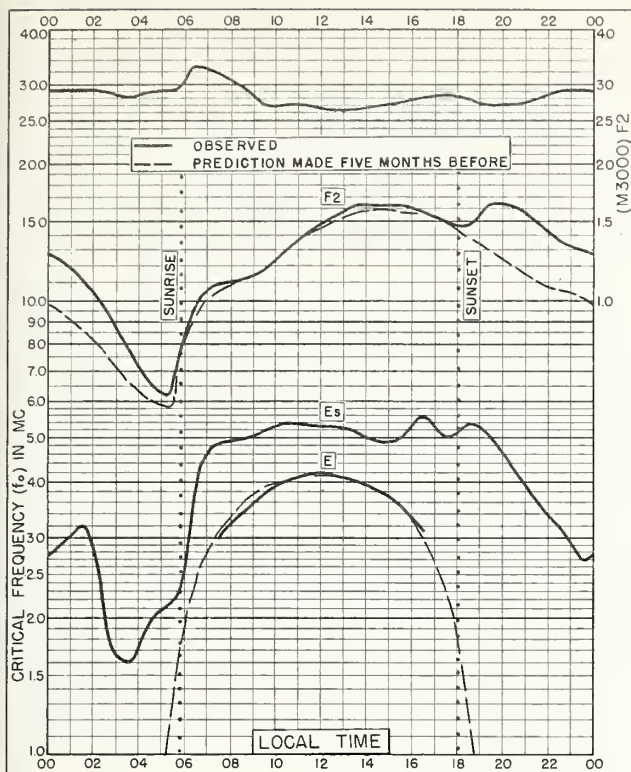


Fig. 13. OKINAWA I.

26.3°N, 127.8°E

SEPTEMBER 1956

NBS 503

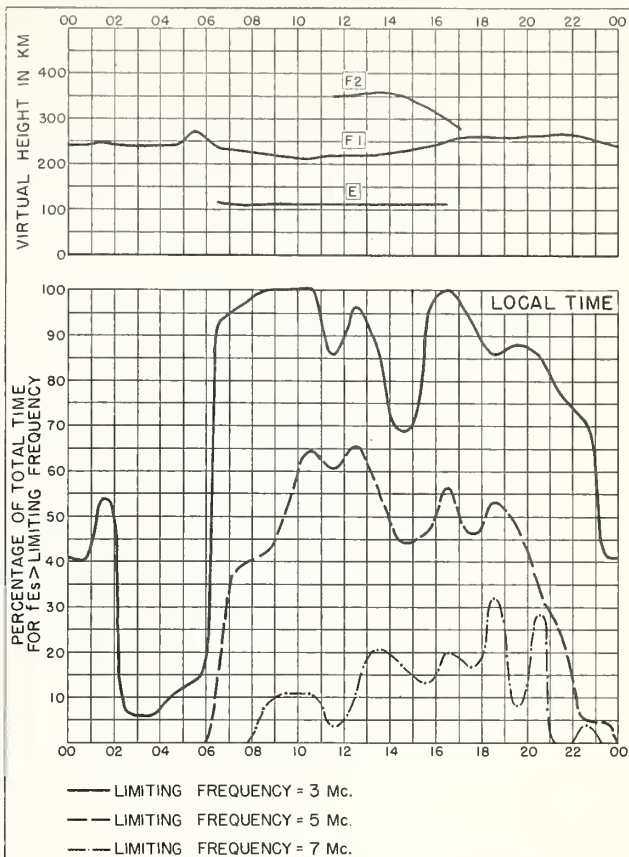


Fig. 14. OKINAWA I.

SEPTEMBER 1956

NBS 490

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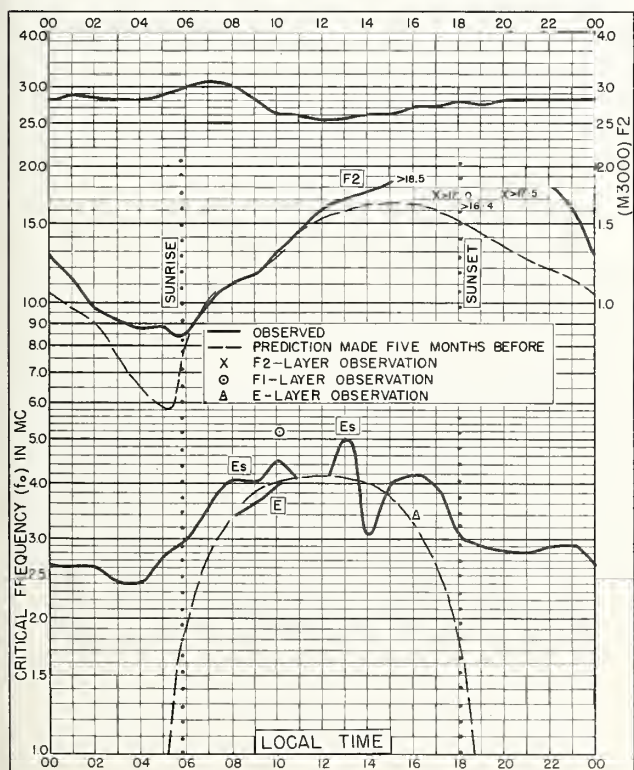


Fig. 15. FORMOSA, CHINA

25.0°N, 121.5°E

SEPTEMBER 1956

NBS 503

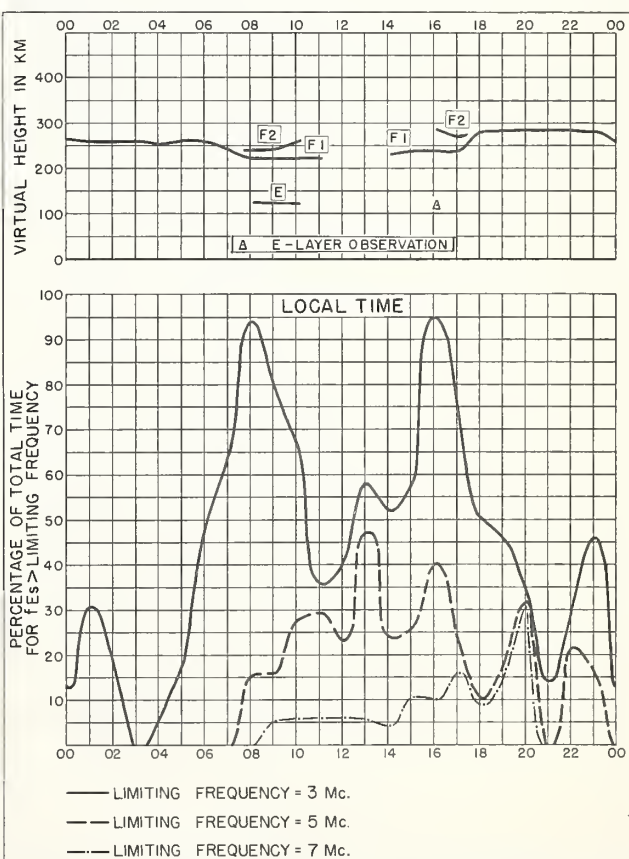


Fig. 16. FORMOSA, CHINA

SEPTEMBER 1956

NBS 490

U. S. GOVERNMENT PRINTING OFFICE: 1957

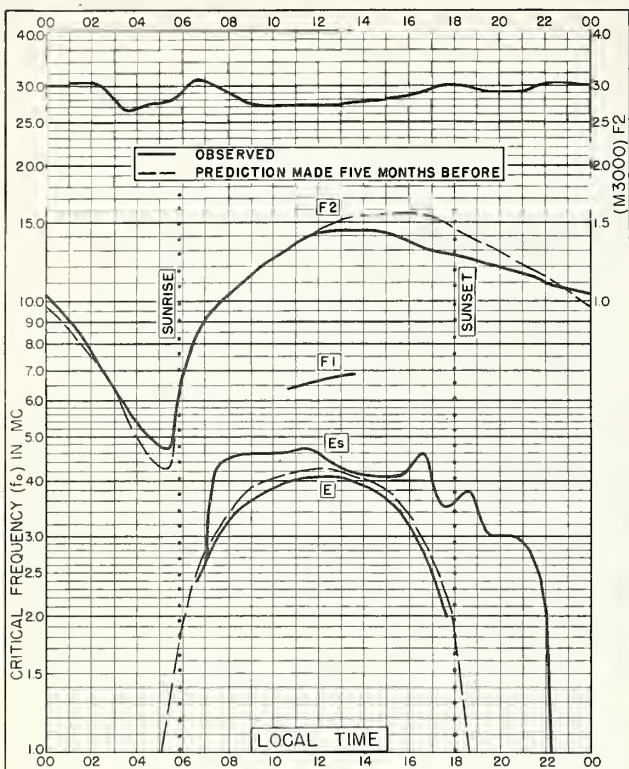


Fig. 17. MAUI, HAWAII  
20.8°N, 156.5°W SEPTEMBER 1956

NBS 503

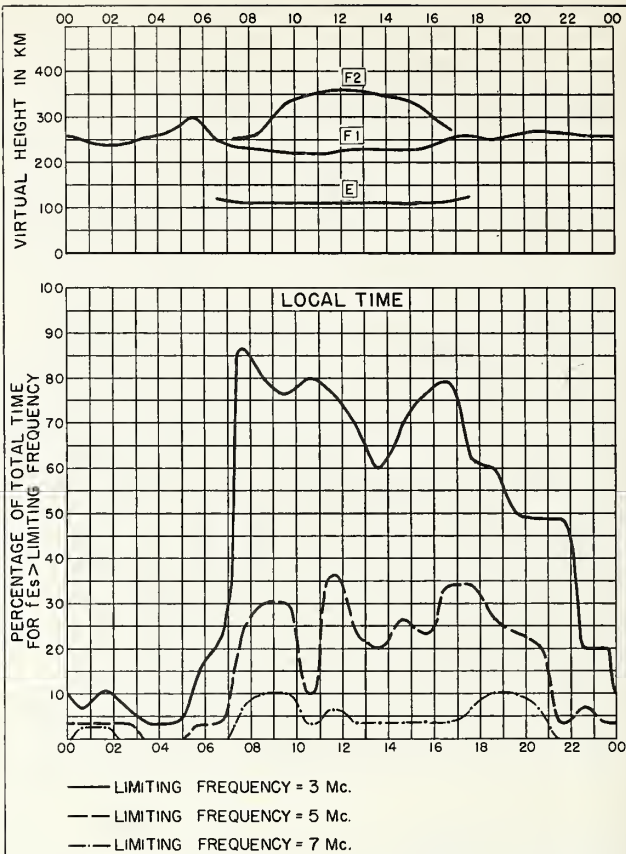


Fig. 18. MAUI, HAWAII SEPTEMBER 1956

NBS 490

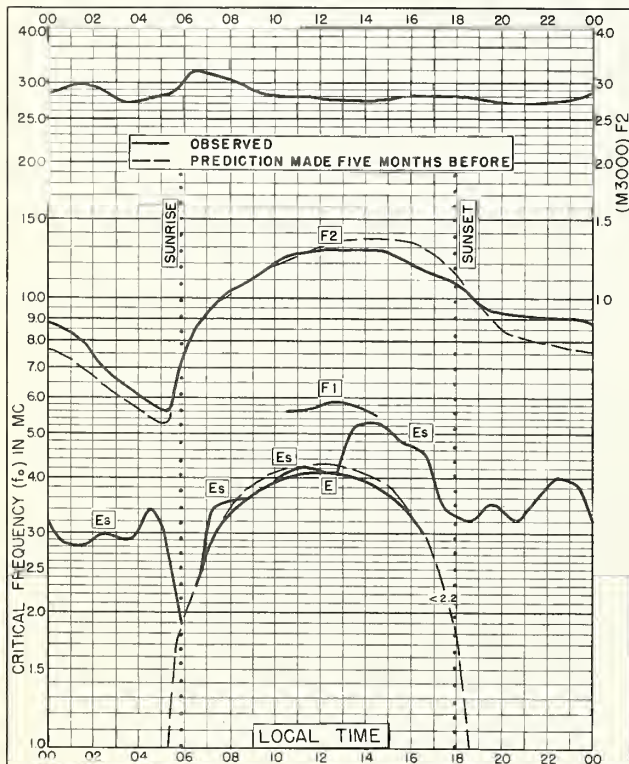


Fig. 19. PUERTO RICO, W. I.  
18.5°N, 67.2°W SEPTEMBER 1956

NBS 503

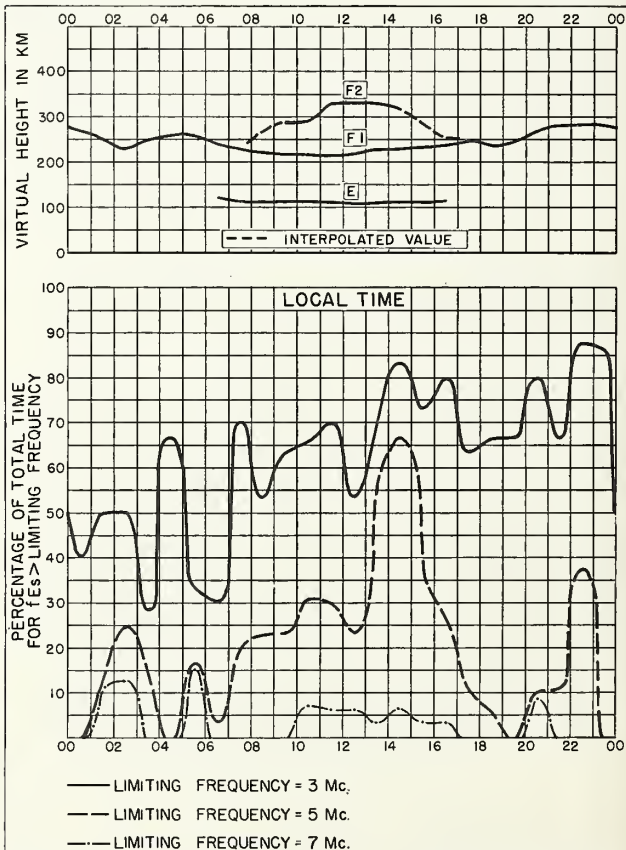


Fig. 20. PUERTO RICO, W. I. SEPTEMBER 1956

NBS 490

U. S. GOVERNMENT PRINTING OFFICE: 1957



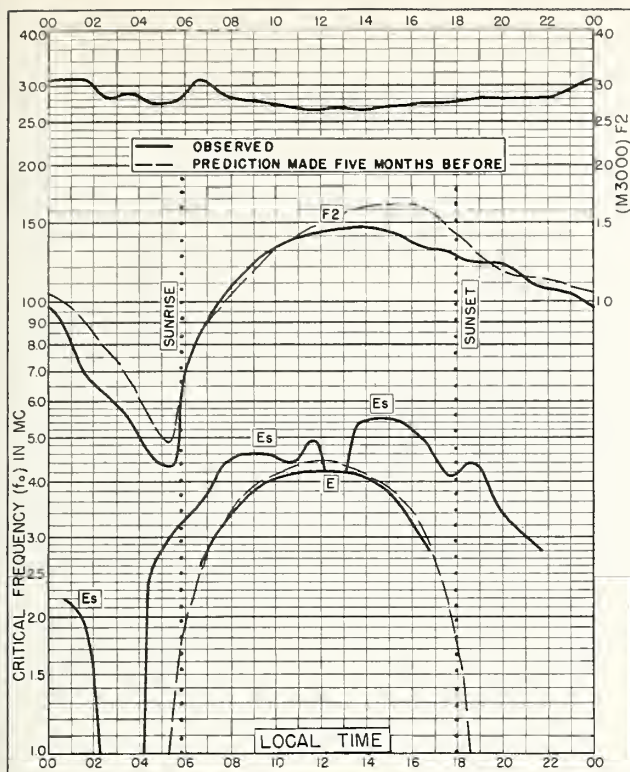


Fig. 21. PANAMA CANAL ZONE  
9.4°N, 79.9°W SEPTEMBER 1956

NBS 503

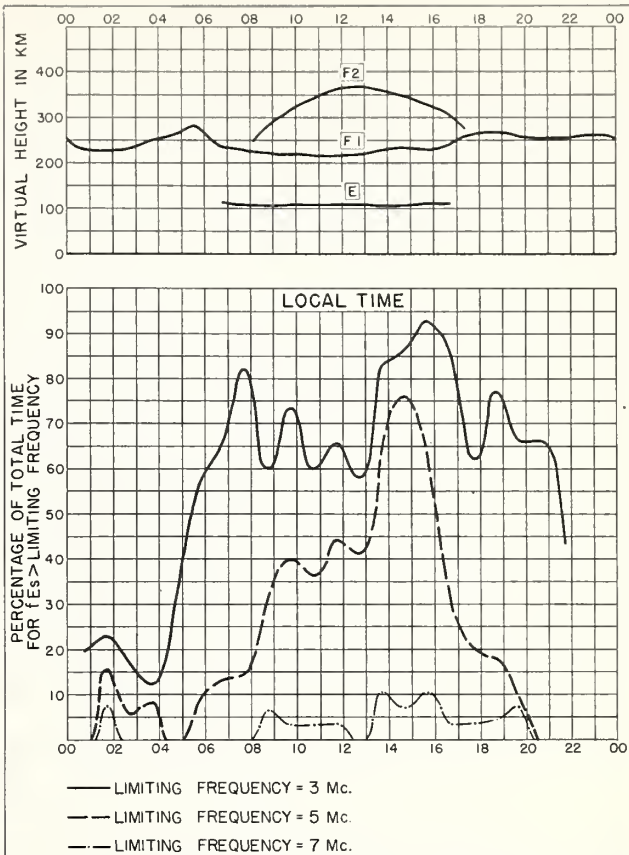


Fig. 22. PANAMA CANAL ZONE SEPTEMBER 1956

NBS 490

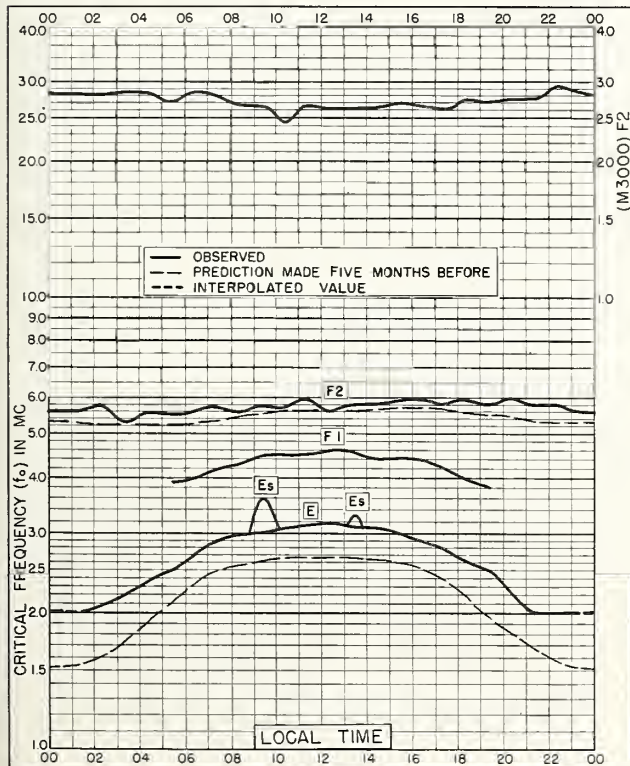


Fig. 23. THULE, GREENLAND  
77.0°N, 69.0°W AUGUST 1956

NBS 503

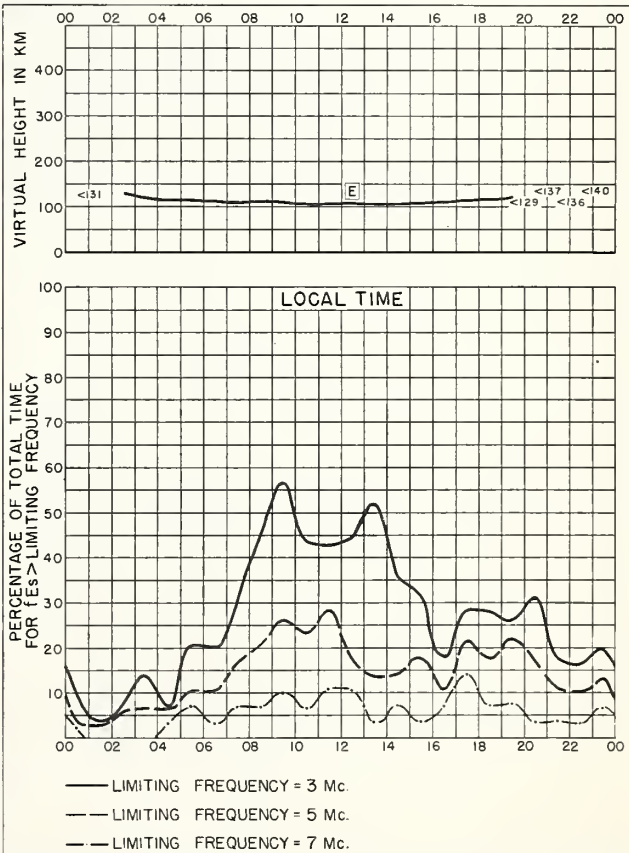


Fig. 24. THULE, GREENLAND AUGUST 1956

NBS 490

NBS 490

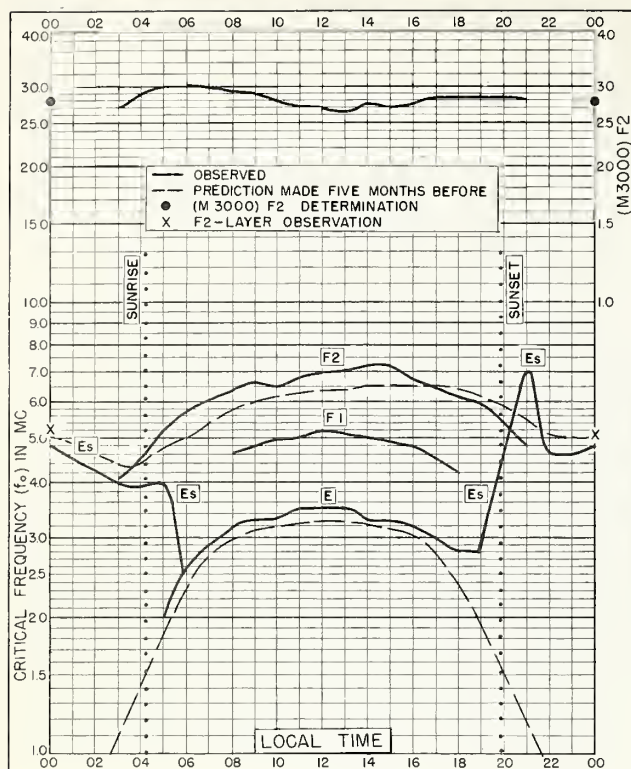


Fig. 25. NARSARSSUAK, GREENLAND  
61.2°N, 45.4°W  
AUGUST 1956

NBS 503

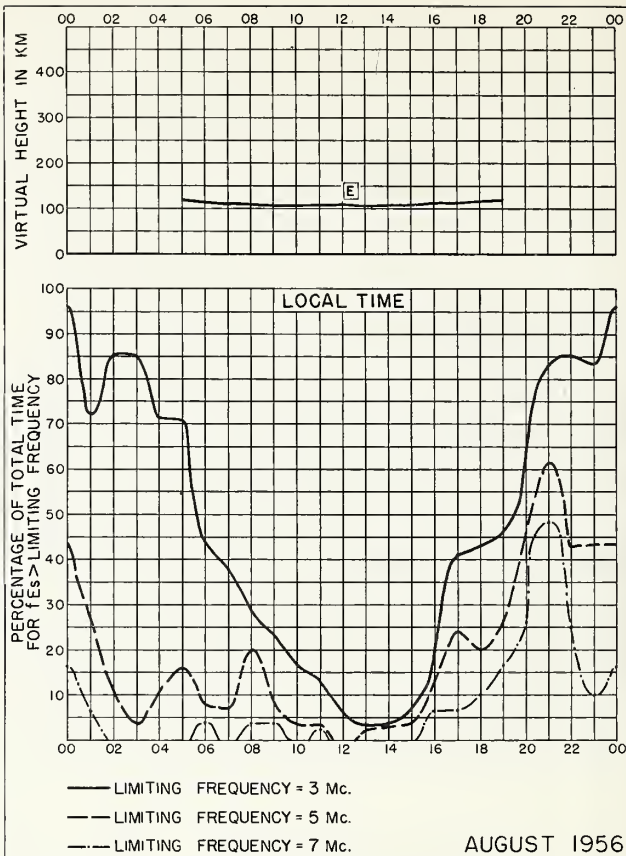


Fig. 26. NARSARSSUAK, GREENLAND

AUGUST 1956

NBS 490

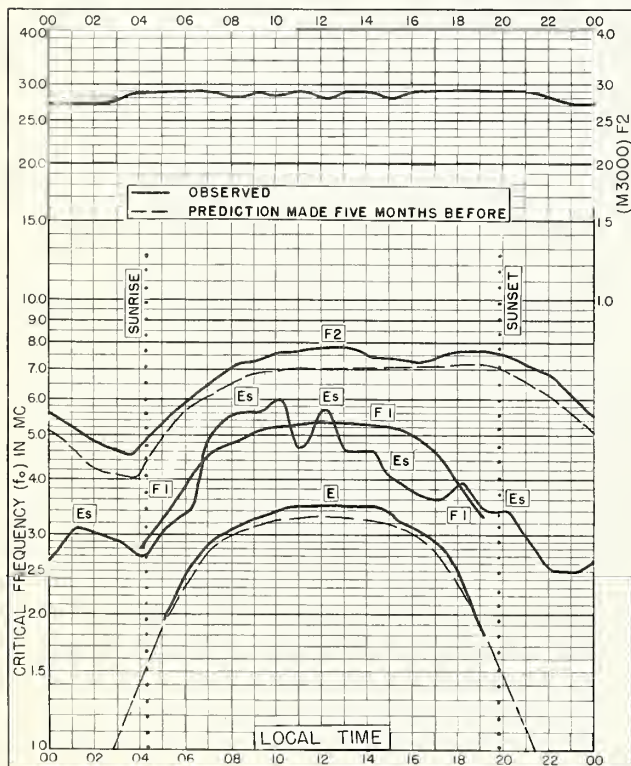


Fig. 27. UPSALA, SWEDEN  
59.8°N, 17.6°E  
AUGUST 1956

NBS 503

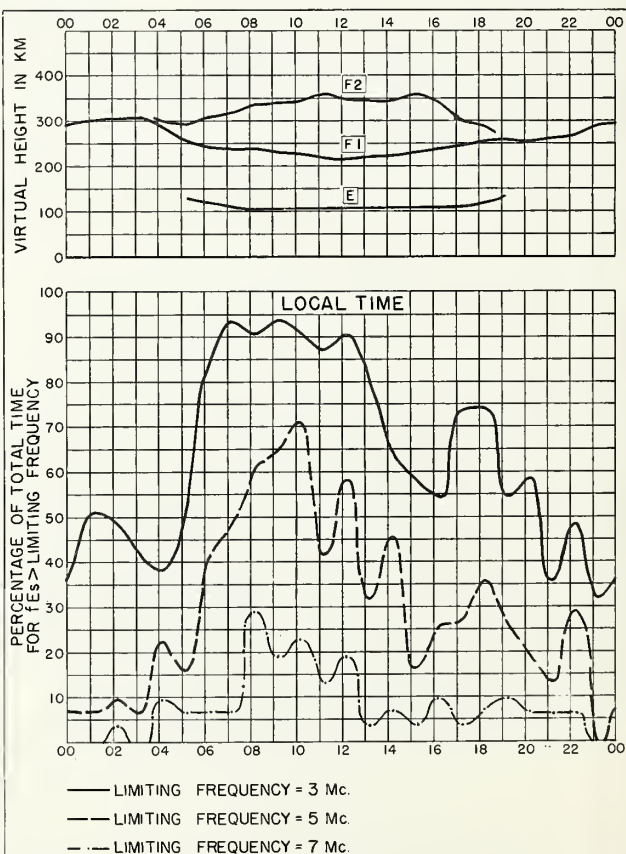


Fig. 28. UPSALA, SWEDEN

AUGUST 1956

NBS 490

NBS 490



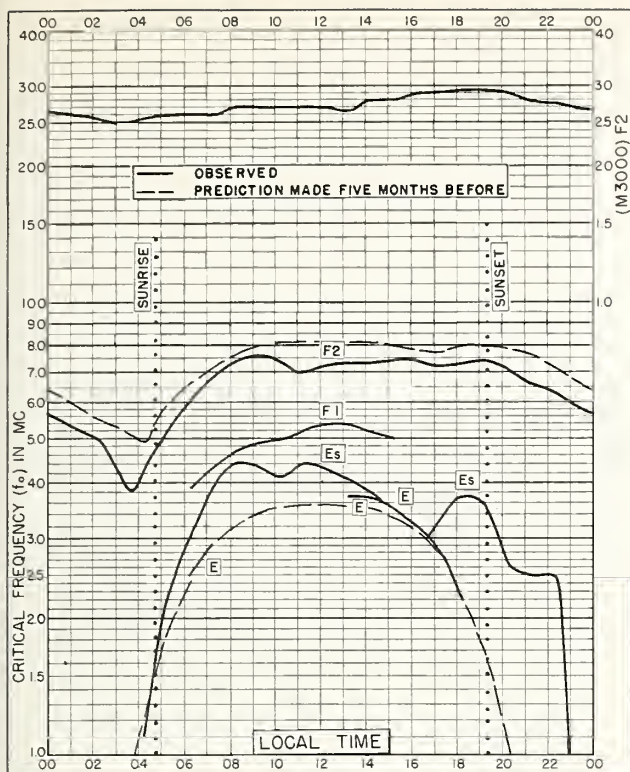


Fig. 29. ADAK, ALASKA  
51.9°N, 176.6°W

AUGUST 1956

NBS 503

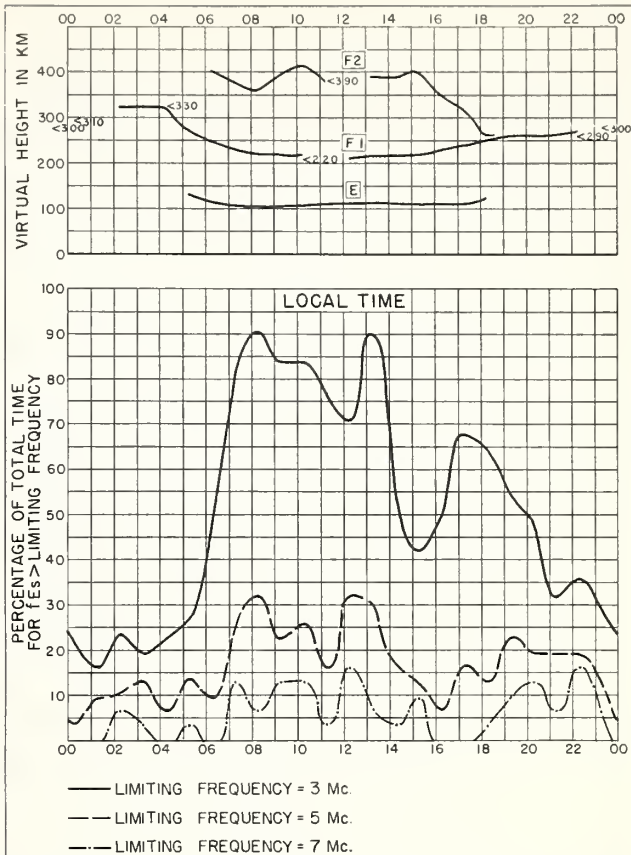


Fig. 30. ADAK, ALASKA

AUGUST 1956

NBS 490

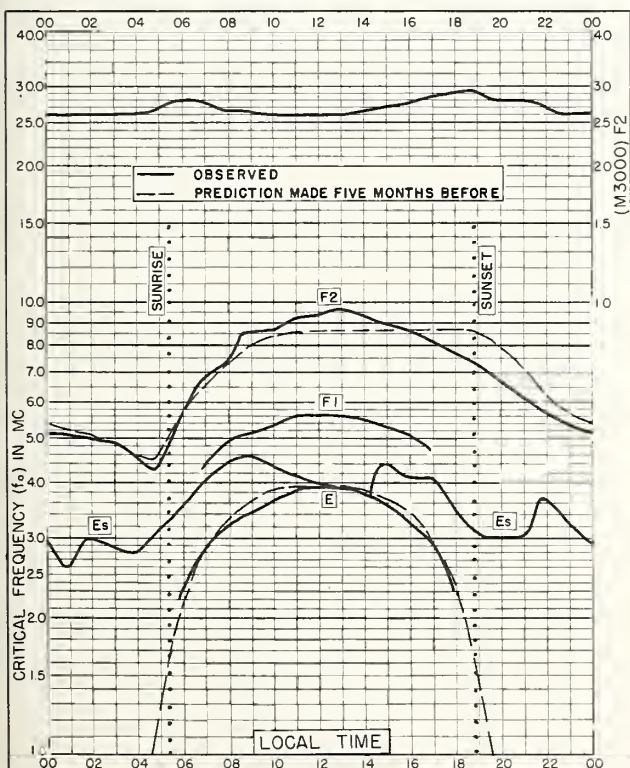


Fig. 31. SAN FRANCISCO, CALIFORNIA  
37.4°N, 122.2°W

AUGUST 1956

NBS 503

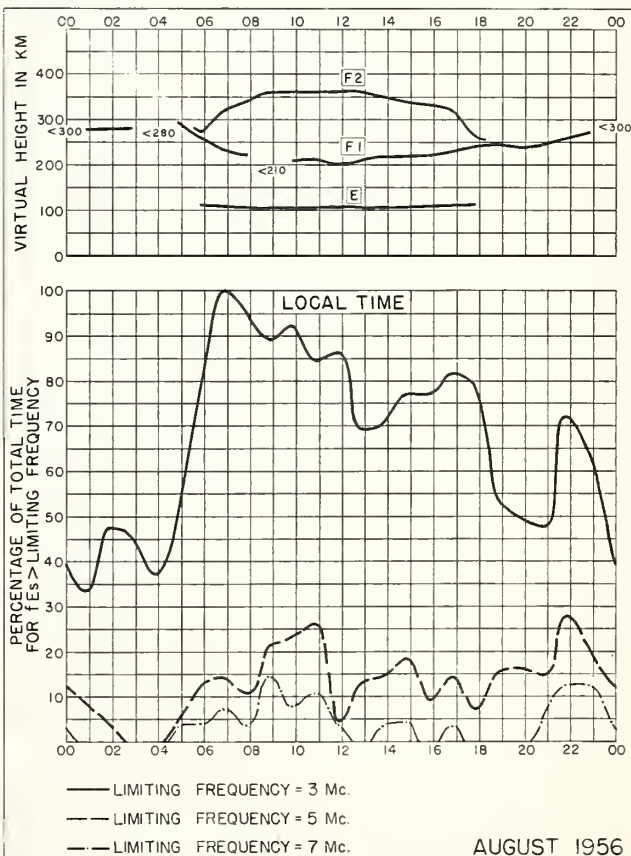
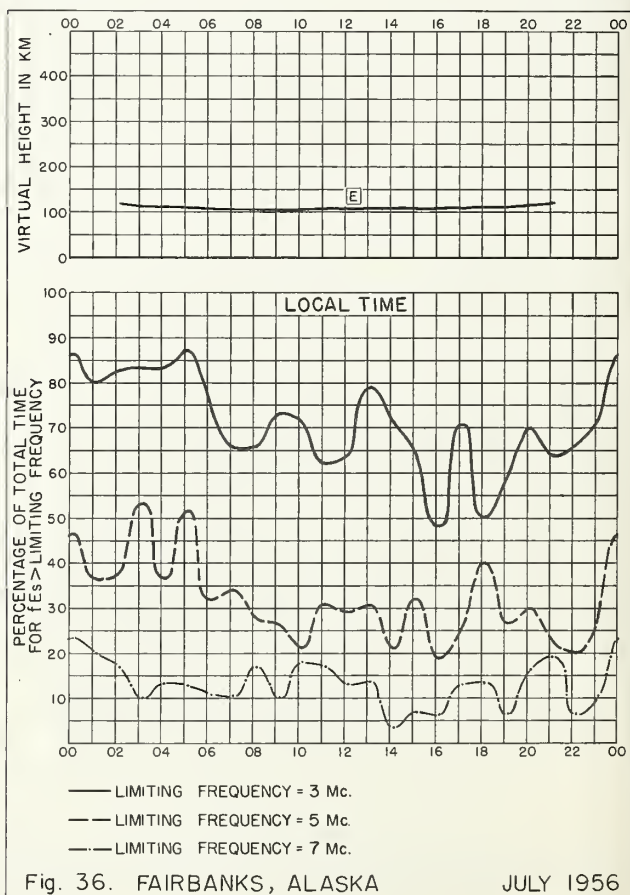
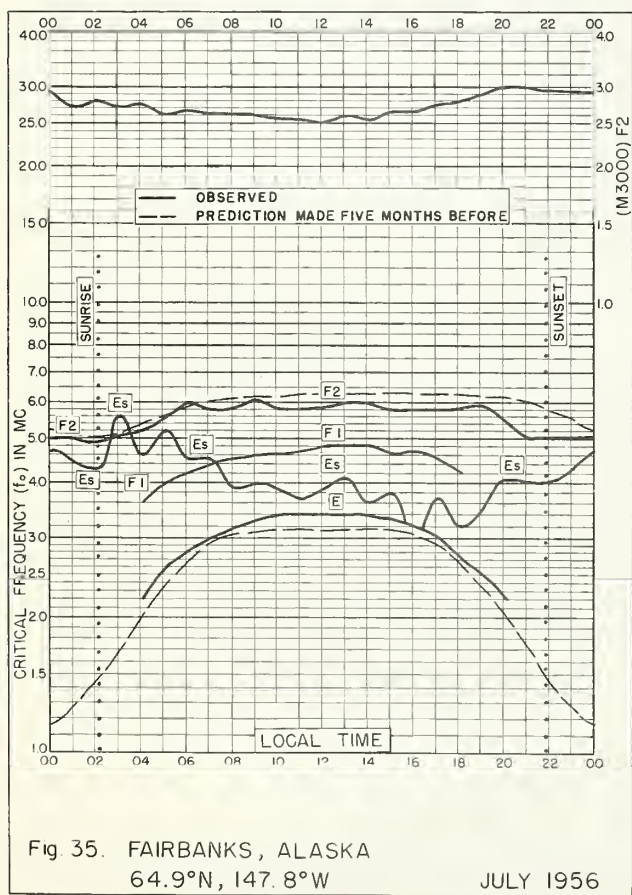
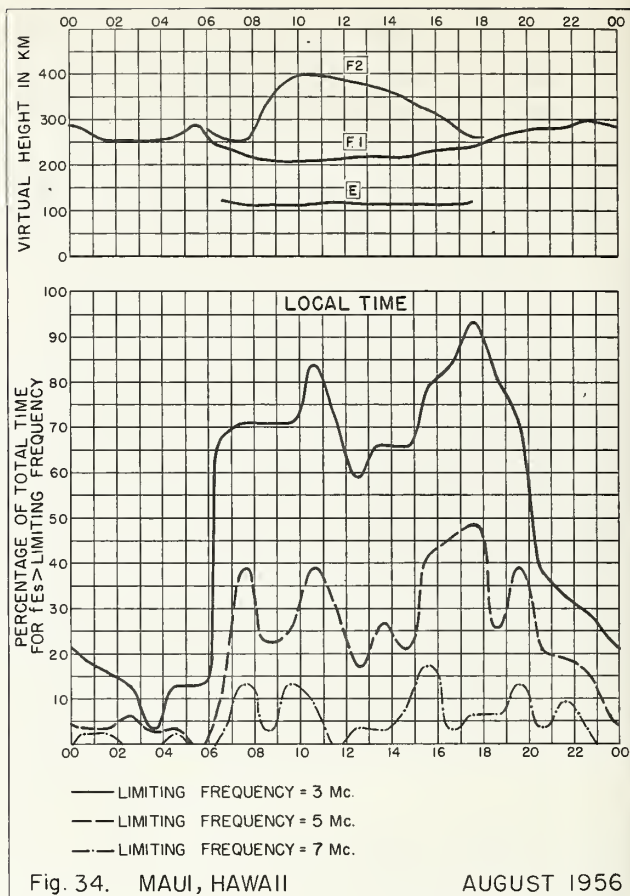
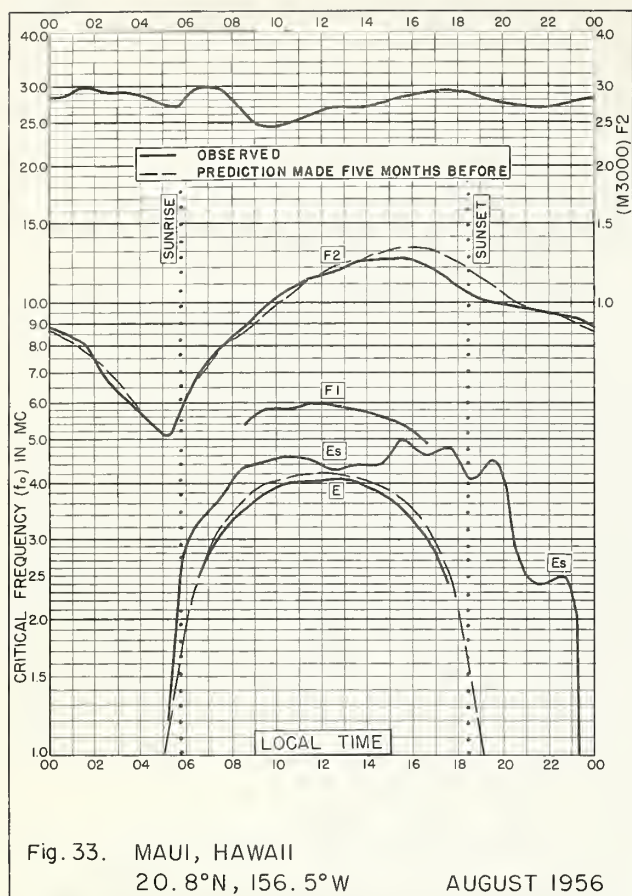


Fig. 32. SAN FRANCISCO, CALIFORNIA

AUGUST 1956

NBS 490

N. S. G. 1956-1957





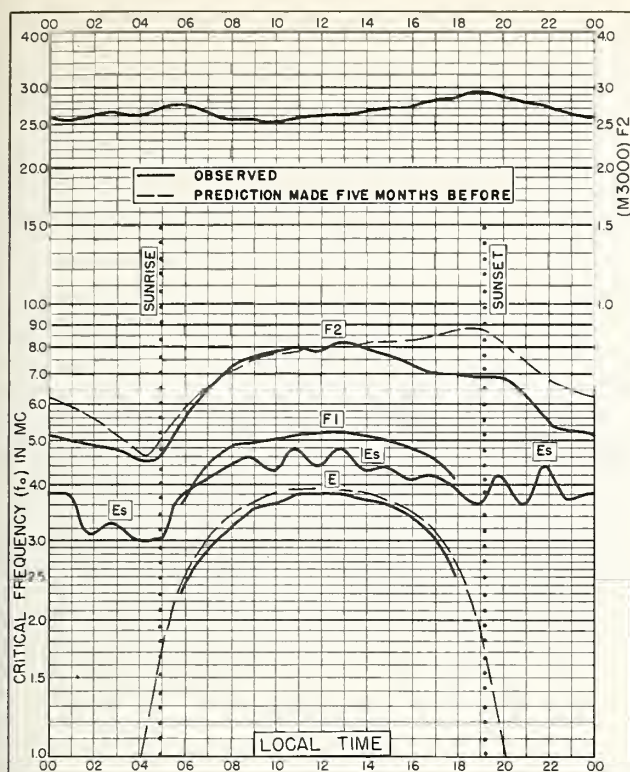


Fig. 37. SAN FRANCISCO, CALIFORNIA  
37.4°N, 122.2°W JULY 1956

NBS 503

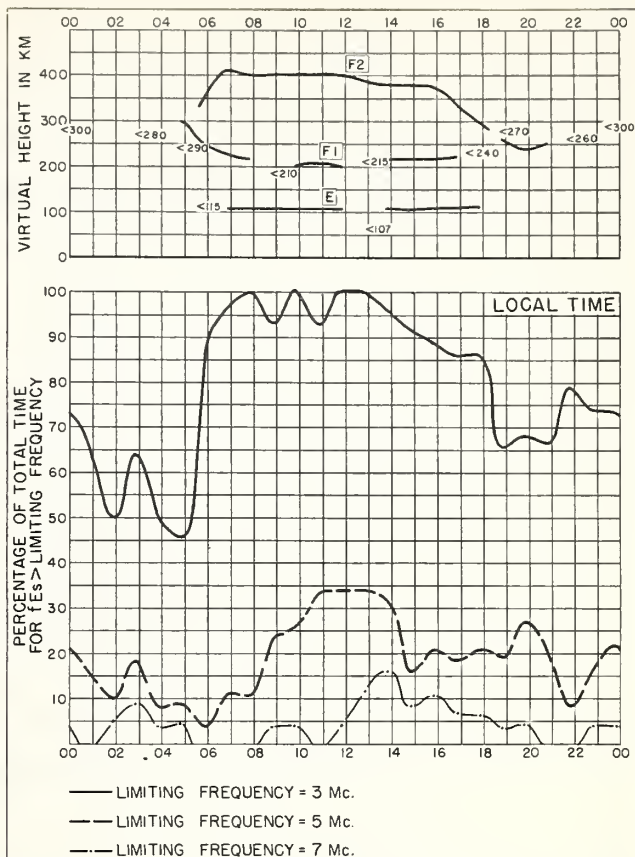


Fig. 38. SAN FRANCISCO, CALIFORNIA JULY 1956

NBS 490

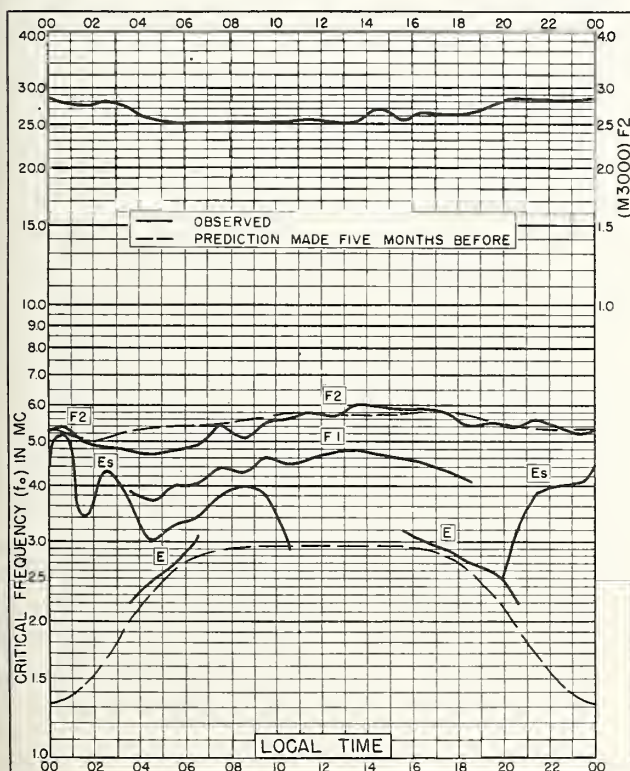


Fig. 39. POINT BARROW, ALASKA  
71.3°N, 156.8°W JUNE 1956

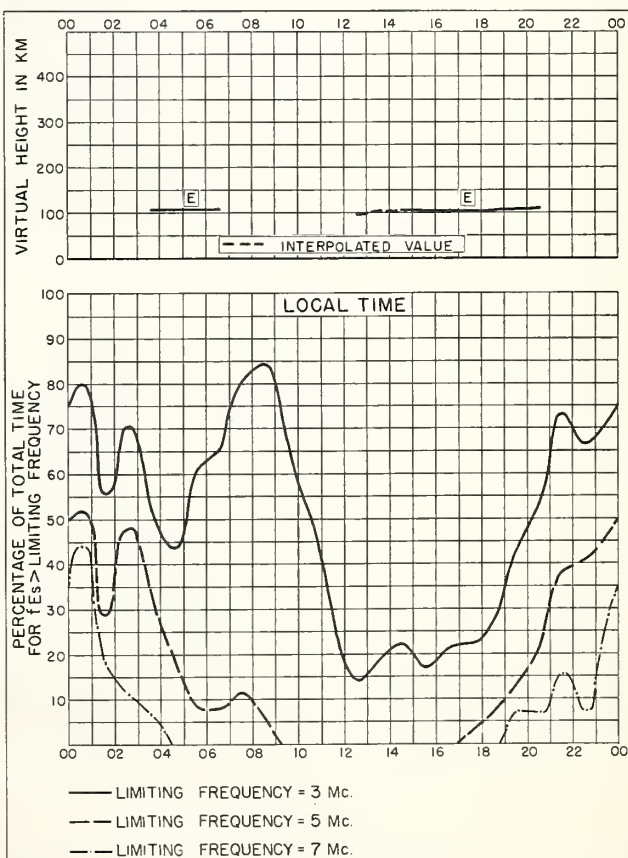


Fig. 40. POINT BARROW, ALASKA JUNE 1956

NBS 490

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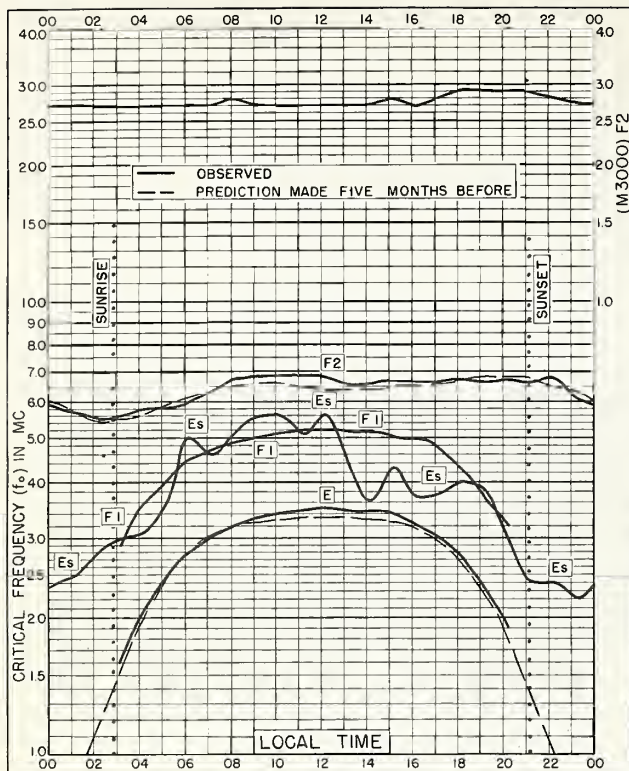


Fig. 41. UPSALA, SWEDEN  
59.8°N, 17.6°E

JUNE 1956

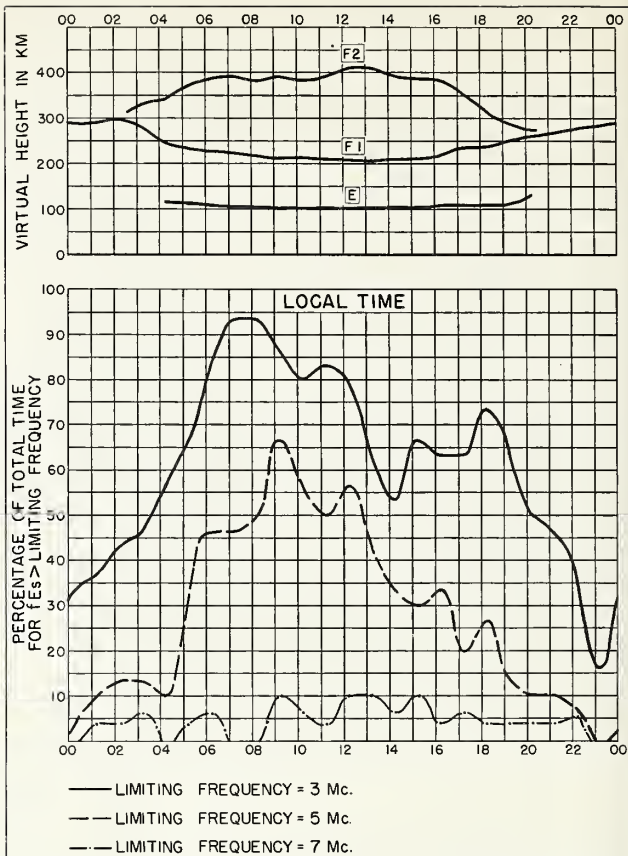


Fig. 42. UPSALA, SWEDEN

JUNE 1956

NBS 490

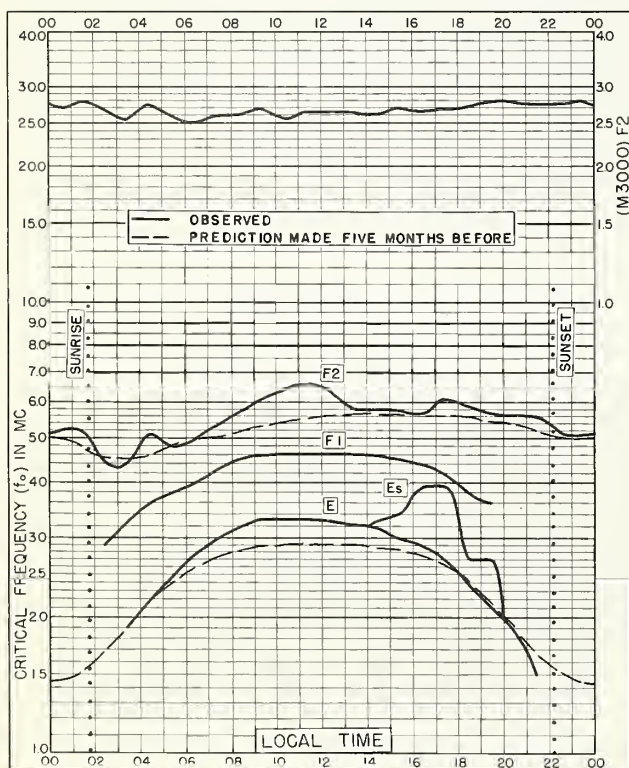


Fig. 43. GODHAVN, GREENLAND  
69.2°N, 53.5°W

MAY 1956

NBS 503

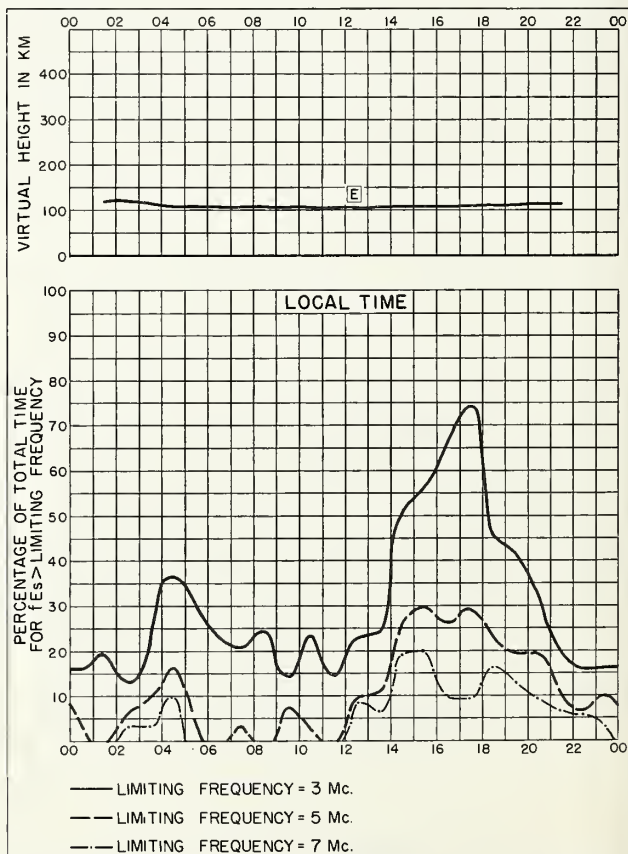


Fig. 44. GODHAVN, GREENLAND

MAY 1956

NBS 490

NBS 503



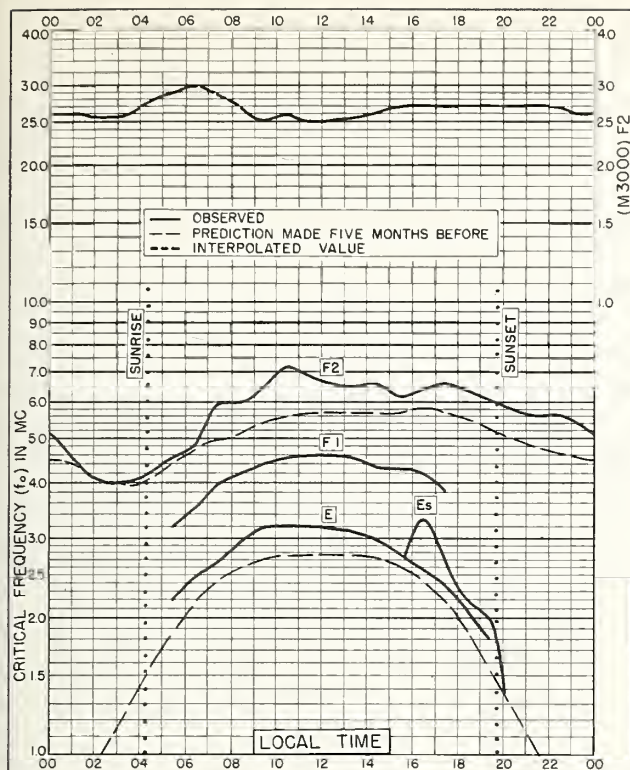


Fig. 45. GODHAVN, GREENLAND  
69.2°N, 53.5°W

APRIL 1956

NBS 503

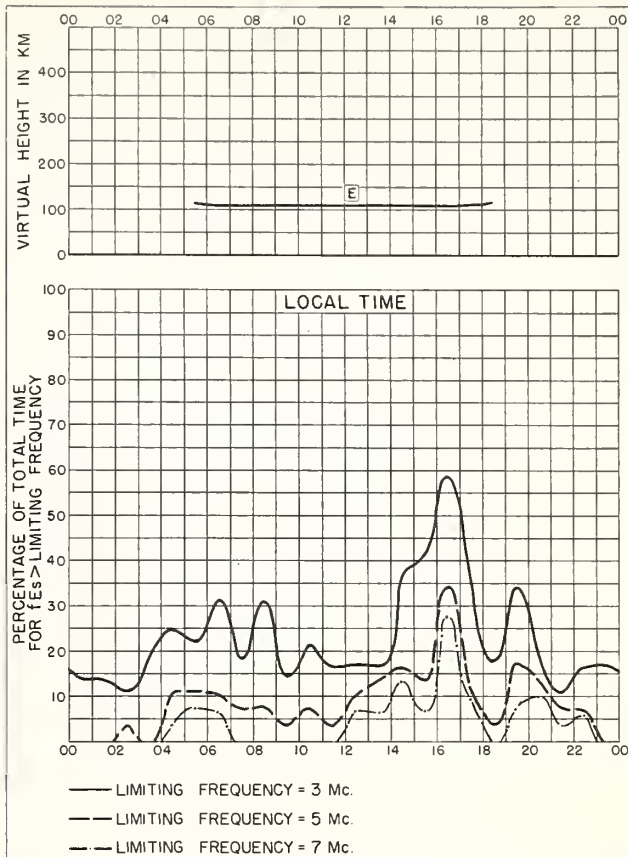


Fig. 46. GODHAVN, GREENLAND

APRIL 1956

NBS 490

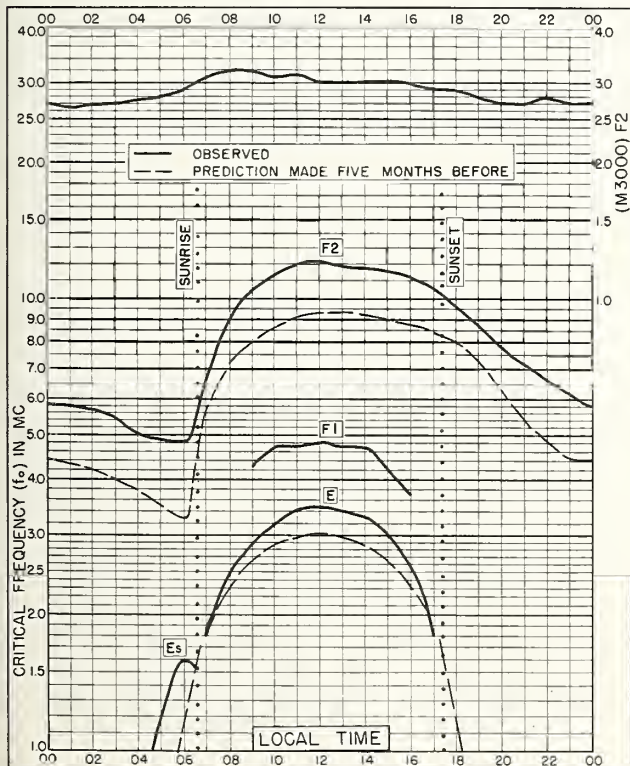


Fig. 47. CHRISTCHURCH, NEW ZEALAND  
43.6°S, 172.8°E

APRIL 1956

NBS 503

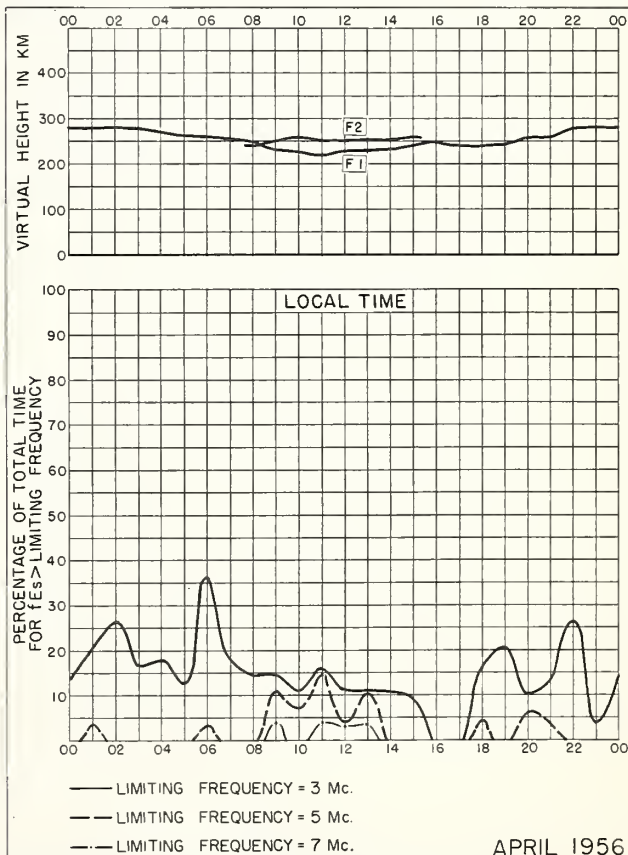


Fig. 48. CHRISTCHURCH, NEW ZEALAND

APRIL 1956

NBS 490

NBS 490

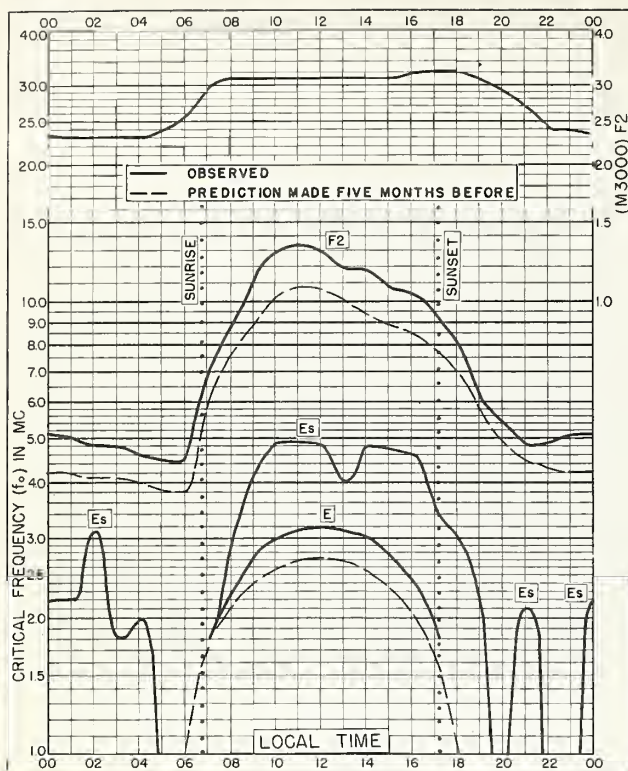


Fig. 49. FALKLAND IS.  
51.7°S, 57.8°W

APRIL 1956

NBS 503

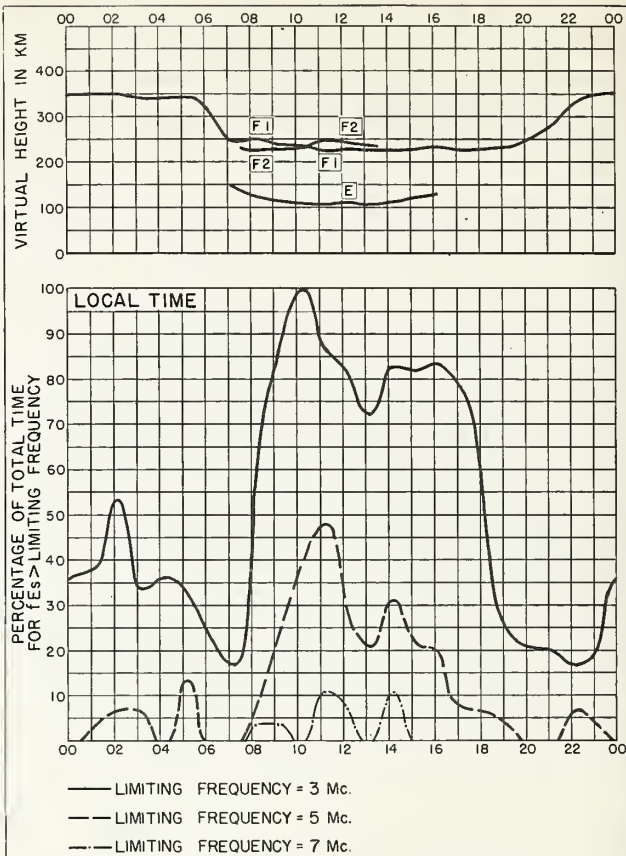


Fig. 50. FALKLAND IS.

APRIL 1956

NBS 490

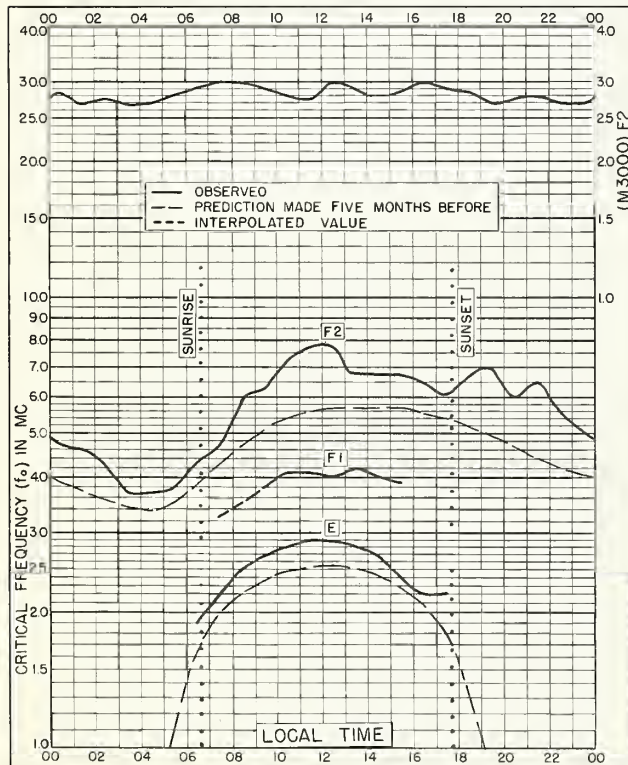


Fig. 51. GODHAVN, GREENLAND  
69.2°N, 53.5°W

MARCH 1956

NBS 503

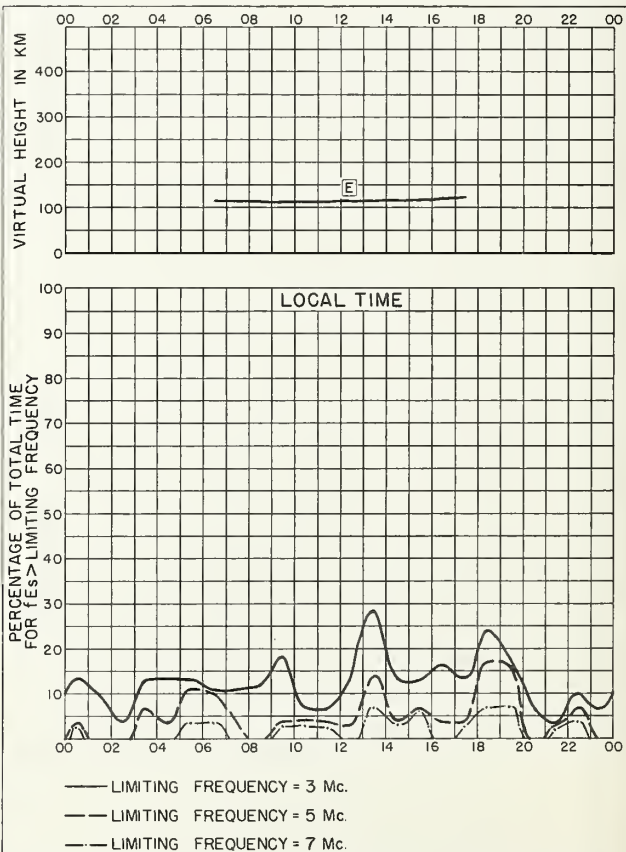


Fig. 52. GODHAVN, GREENLAND

MARCH 1956

NBS 490

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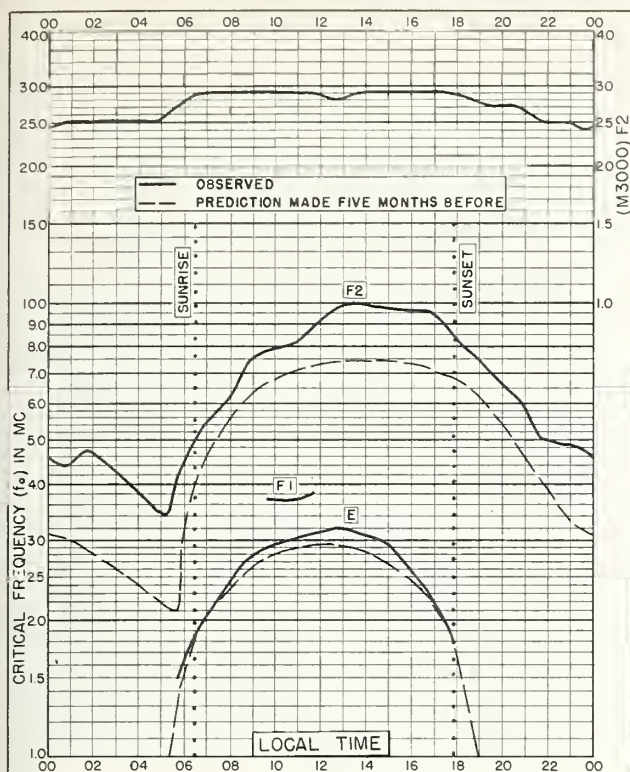


Fig. 53. INVERNESS, SCOTLAND

57.4°N, 4.2°W

MARCH 1956

NBS 503

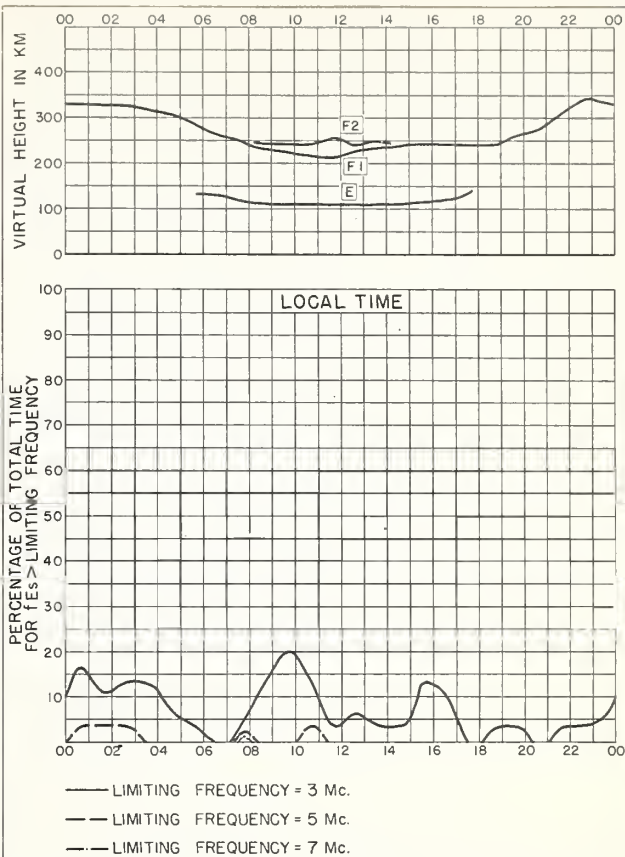


Fig. 54. INVERNESS, SCOTLAND

MARCH 1956

NBS 490

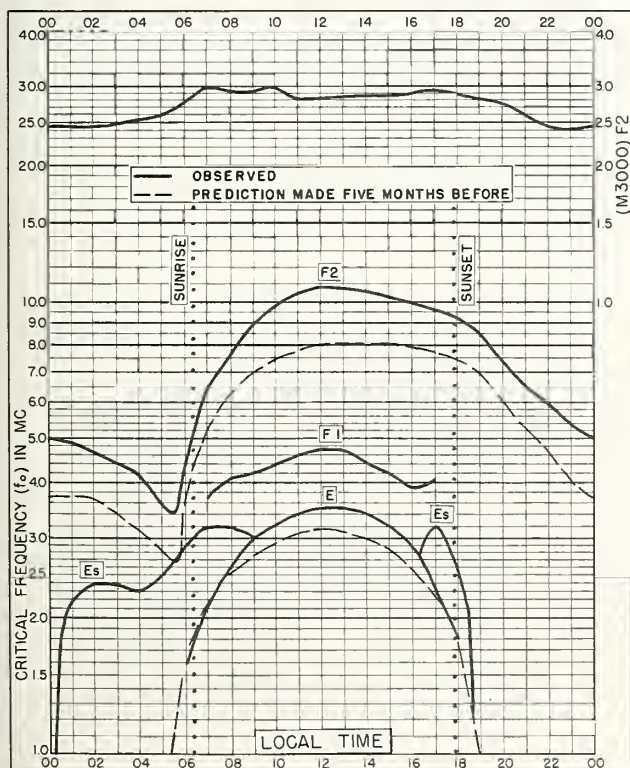


Fig. 55. SLOUGH, ENGLAND

51.5°N, 0.6°W

MARCH 1956

NBS 503

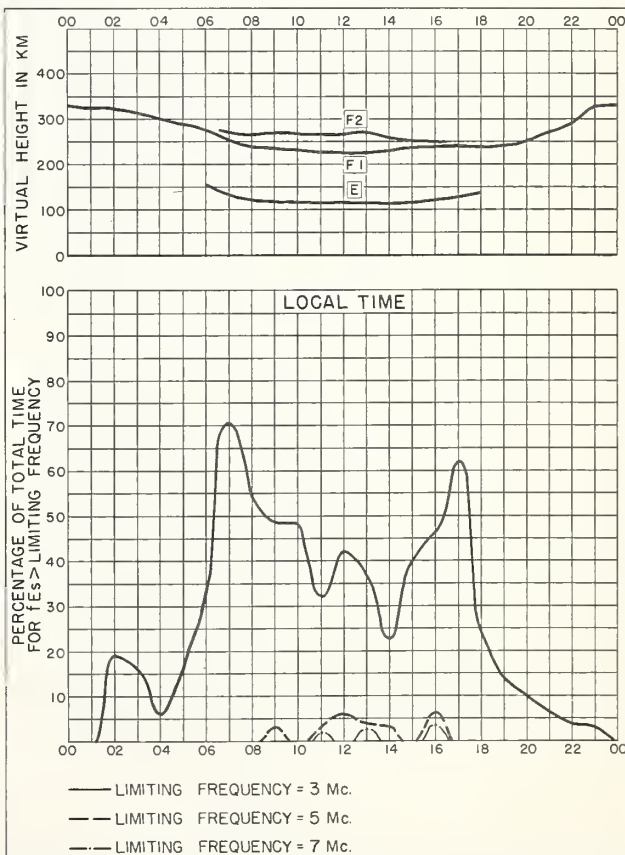


Fig. 56. SLOUGH, ENGLAND

MARCH 1956

NBS 490

NBS 490

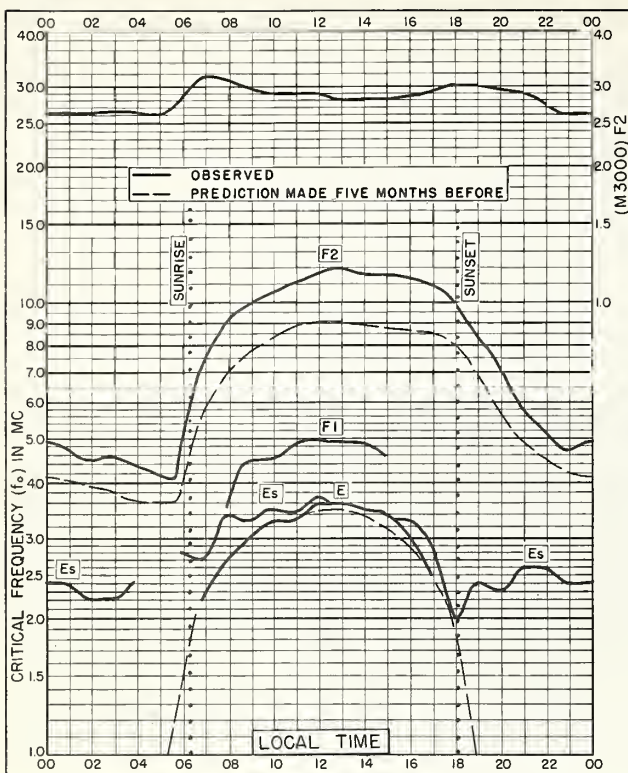


Fig. 57. SAN FRANCISCO, CALIFORNIA  
37.4°N, 122.2°W  
MARCH 1956

NBS 503

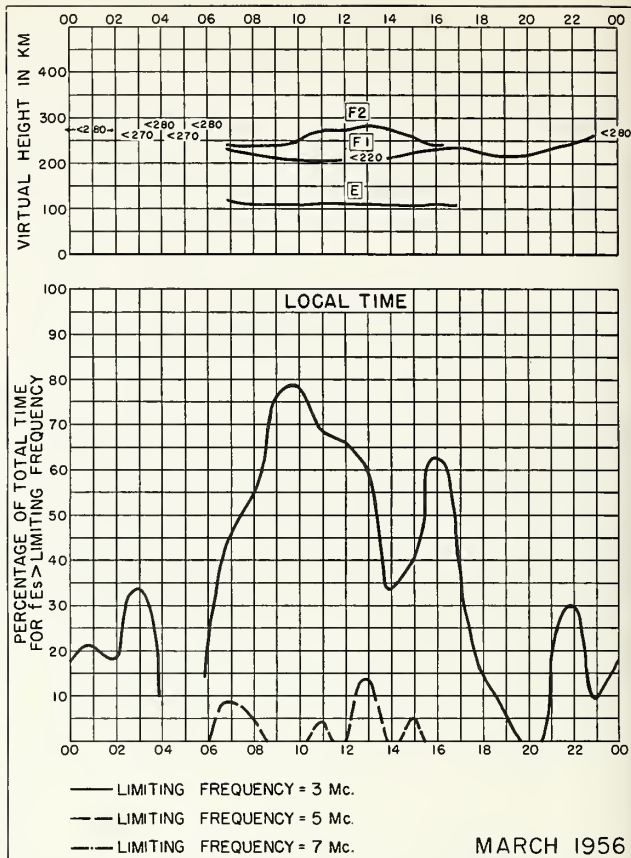


Fig. 58. SAN FRANCISCO, CALIFORNIA

MARCH 1956

NBS 490

U. S. GOVERNMENT PRINTING OFFICE: 1957

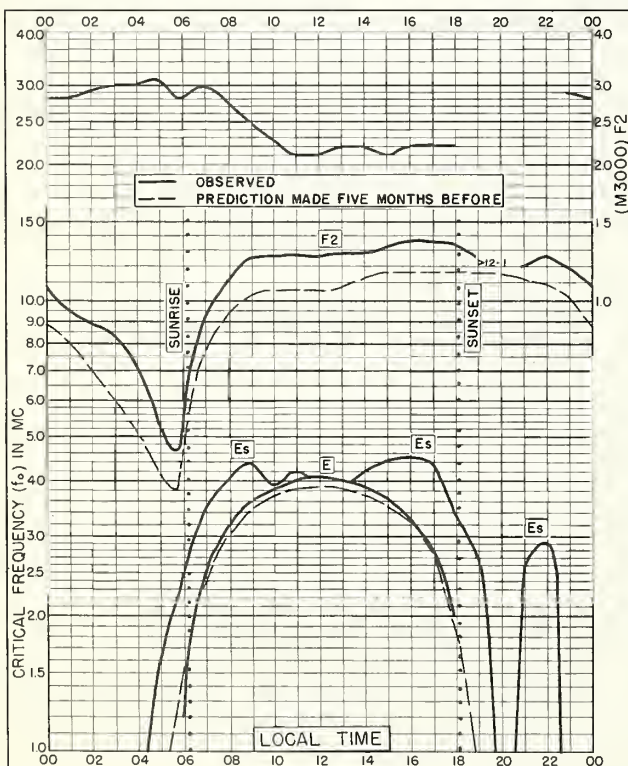


Fig. 59. SINGAPORE, BRITISH MALAYA  
1.3°N, 103.8°E  
MARCH 1956

NBS 503

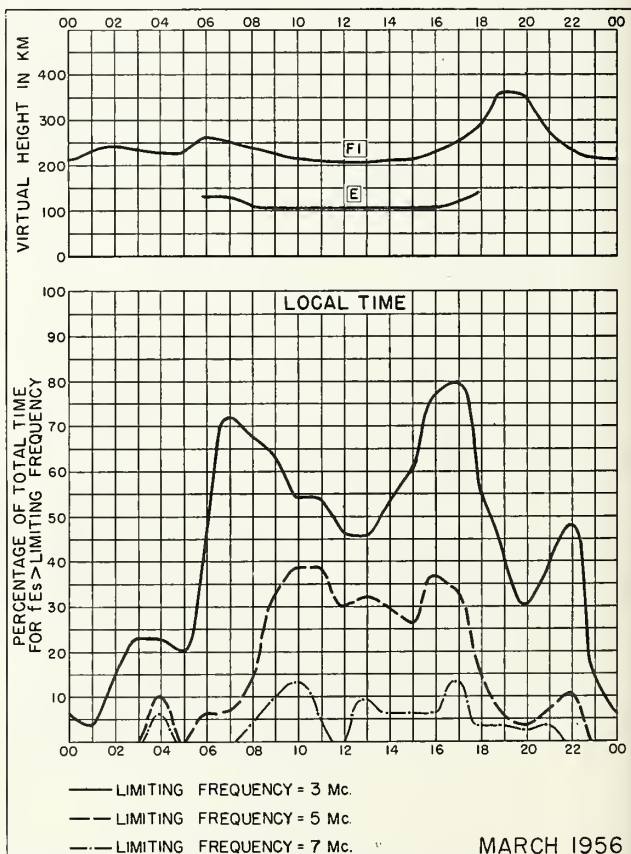


Fig. 60. SINGAPORE, BRITISH MALAYA

MARCH 1956

NBS 490

U. S. GOVERNMENT PRINTING OFFICE: 1957



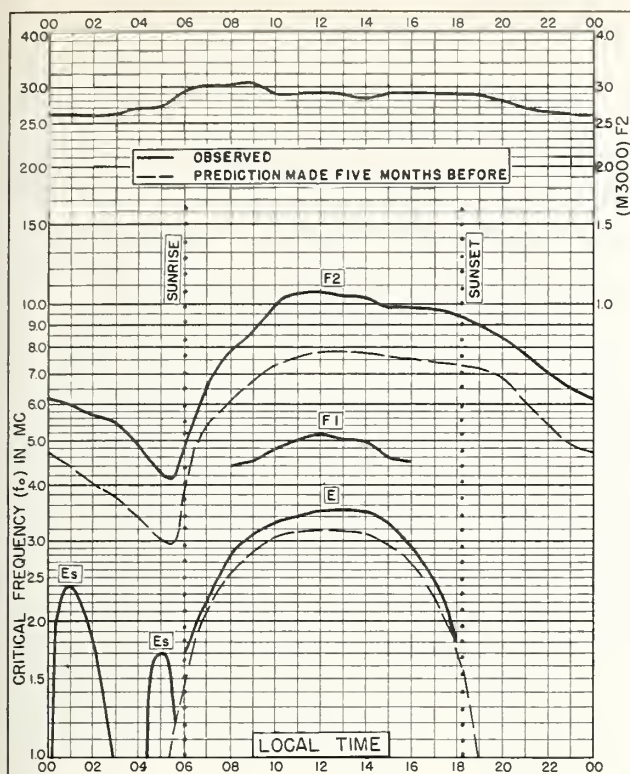


Fig. 61. CHRISTCHURCH, NEW ZEALAND  
43.6°S, 172.8°E  
MARCH 1956

NBS 503

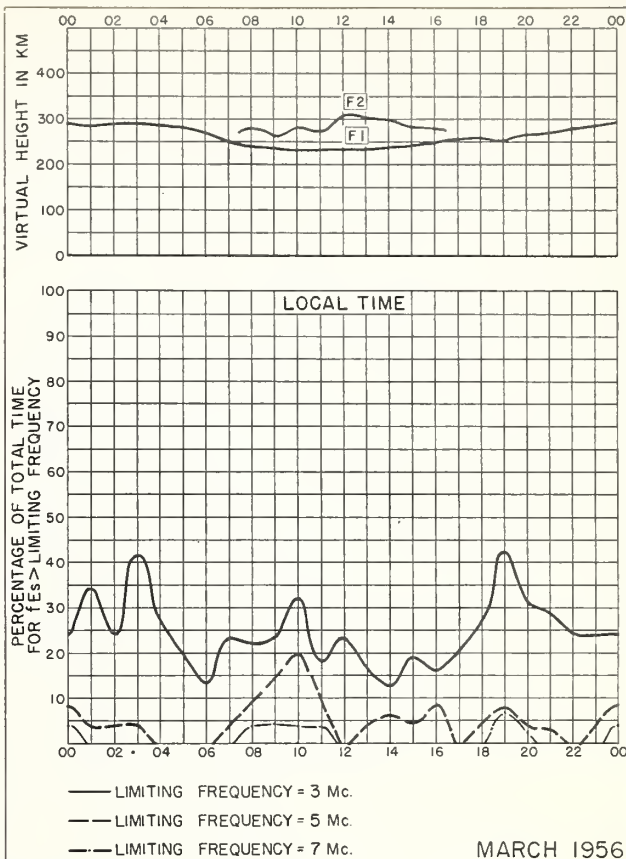


Fig. 62. CHRISTCHURCH, NEW ZEALAND

MARCH 1956

NBS 490

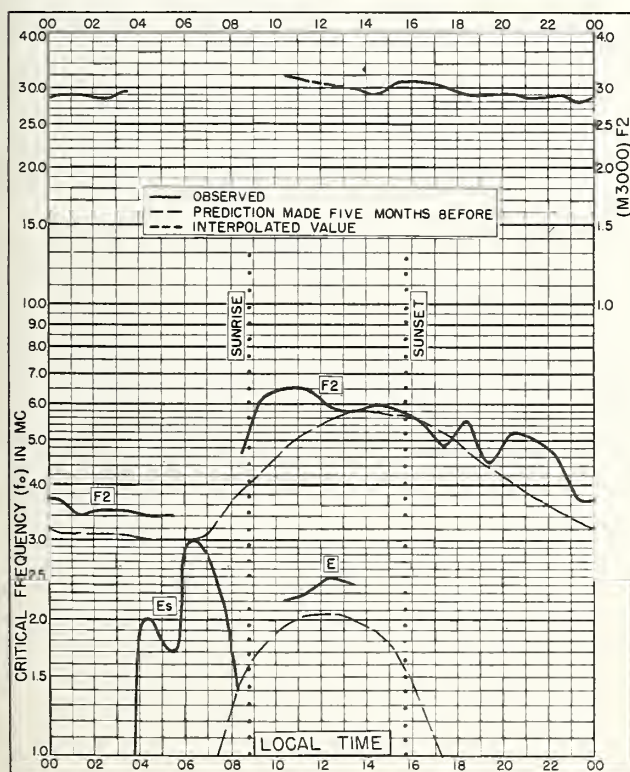


Fig. 63. GODHAVN, GREENLAND  
69.2°N, 53.5°W  
FEBRUARY 1956

NBS 503

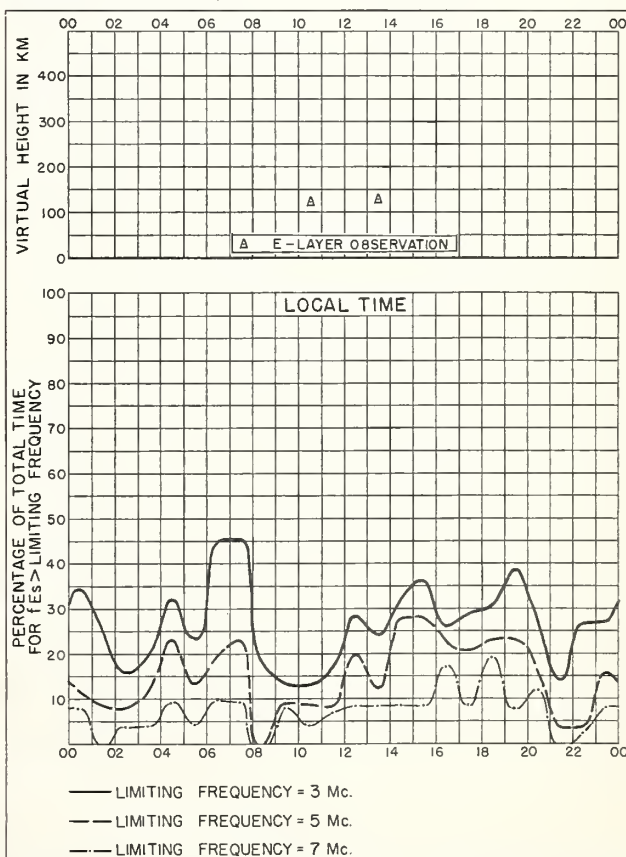


Fig. 64. GODHAVN, GREENLAND FEBRUARY 1956

NBS 490

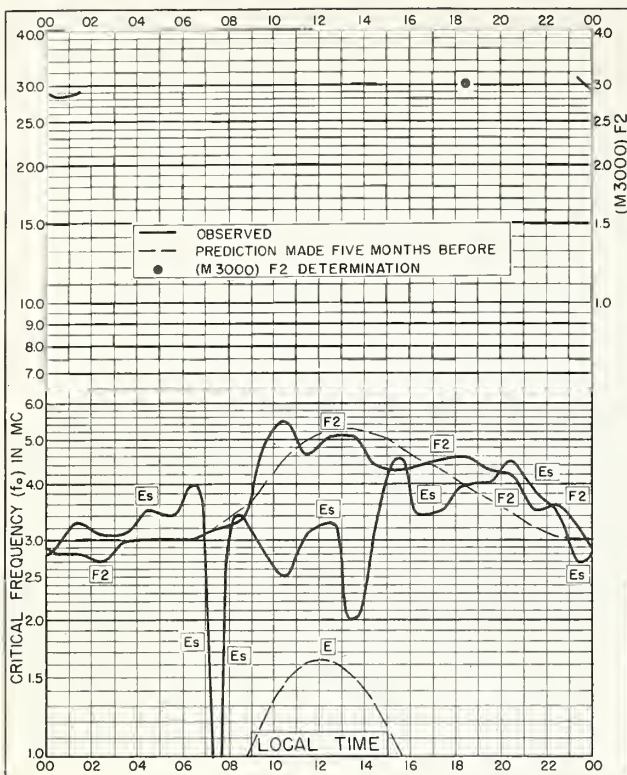


Fig. 65. GODHAVN, GREENLAND  
69.2°N, 53.5°W JANUARY 1956

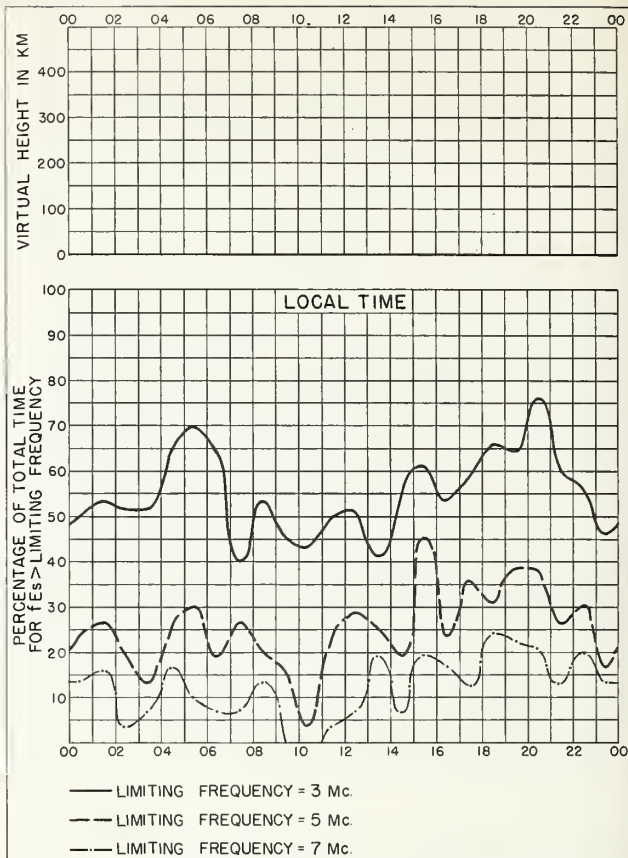


Fig. 66. GODHAVN, GREENLAND JANUARY 1956

NBS 490

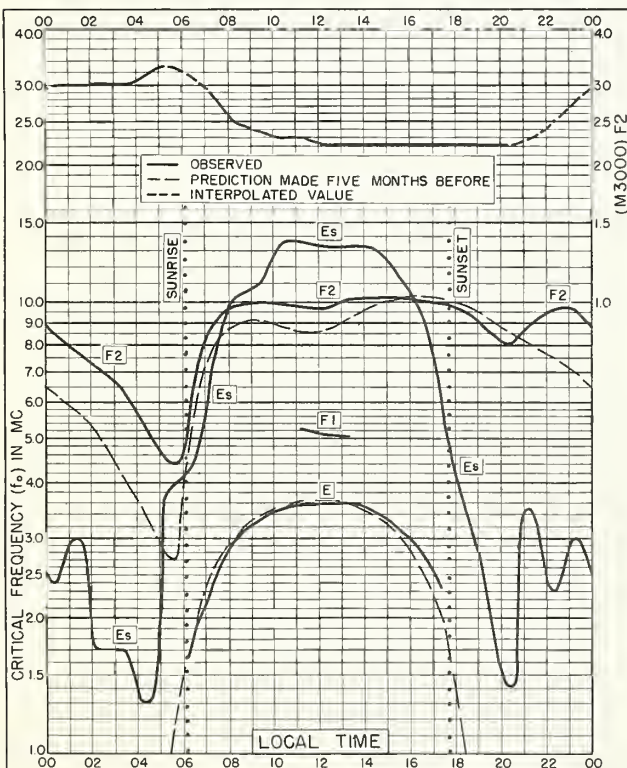


Fig. 67. IBADAN, NIGERIA  
7.4°N, 4.0°E DECEMBER 1955

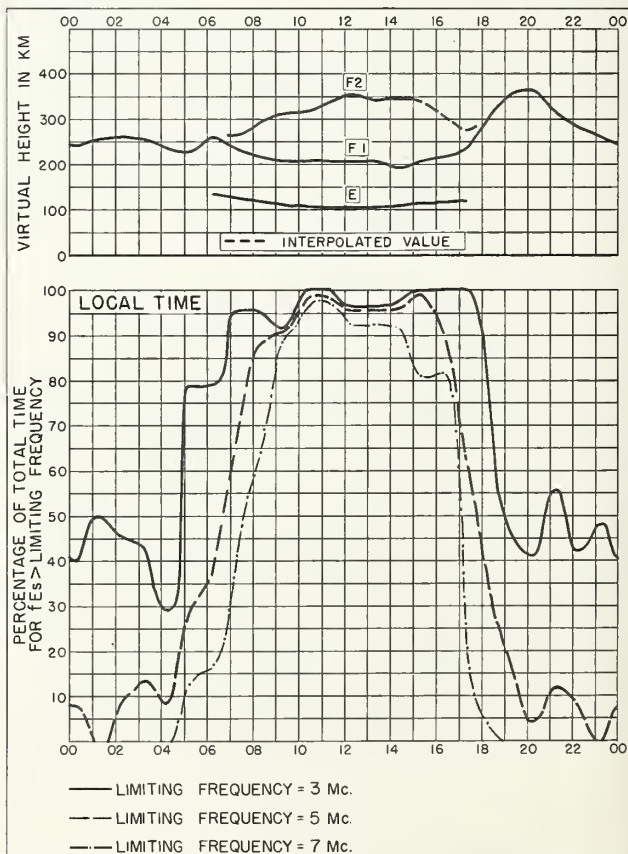


Fig. 68. IBADAN, NIGERIA DECEMBER 1955

NBS 490



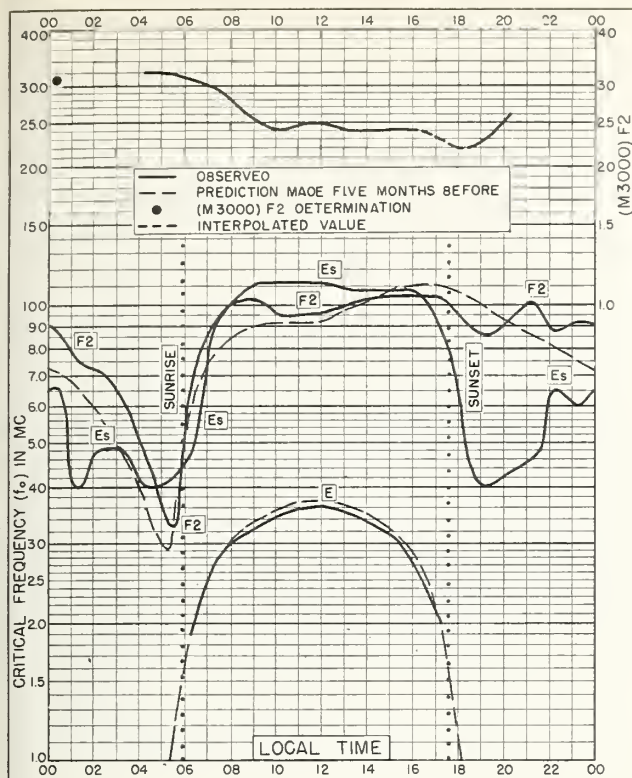


Fig. 69. IBADAN, NIGERIA

7.4°N, 4.0°E

NOVEMBER 1955

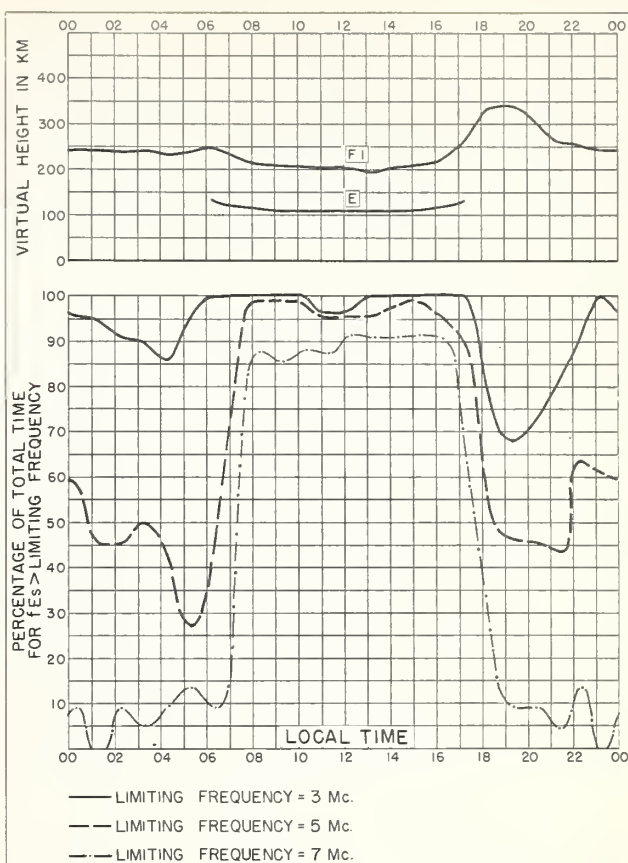


Fig. 70. IBADAN, NIGERIA

NOVEMBER 1955

NRS 490

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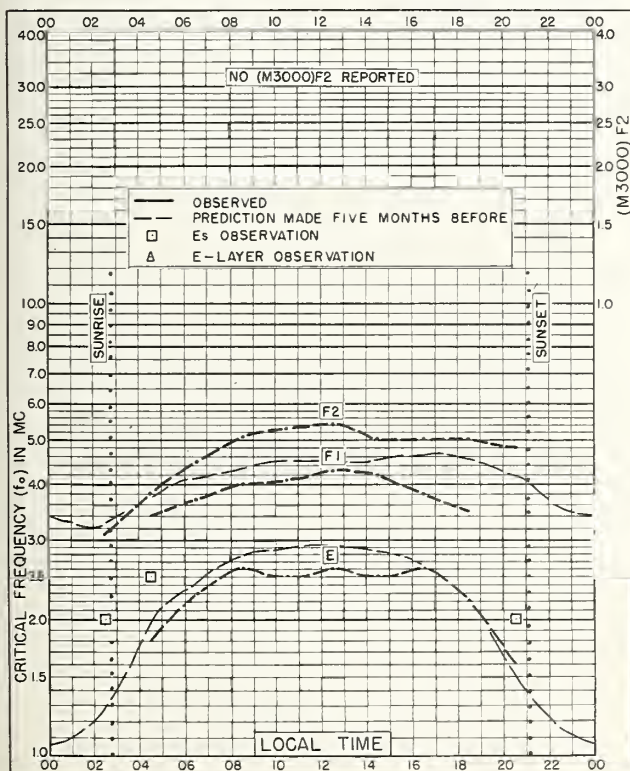


Fig. 71. LULEA, SWEDEN

65.6°N, 22.1°E

MAY 1955

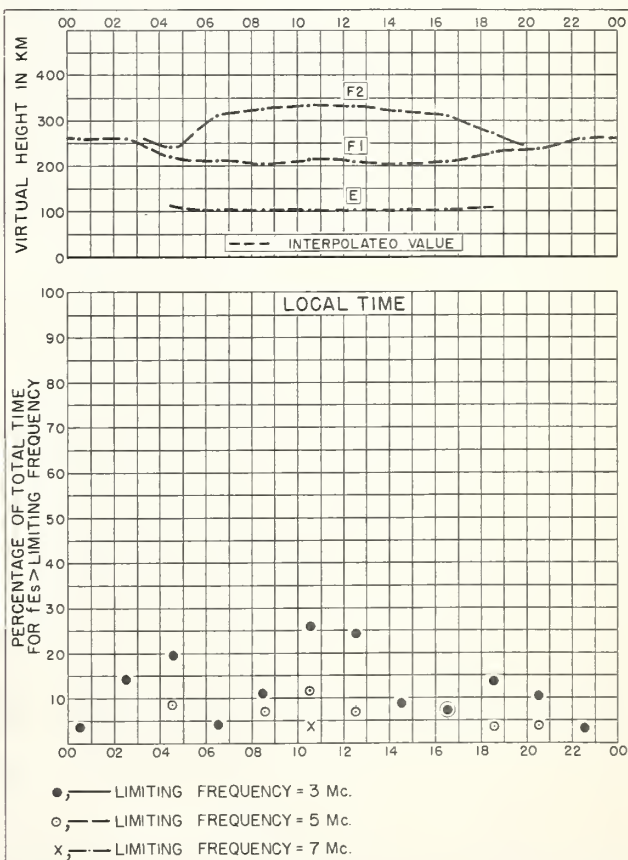


Fig. 72. LULEA, SWEDEN

MAY 1955

NBS 490

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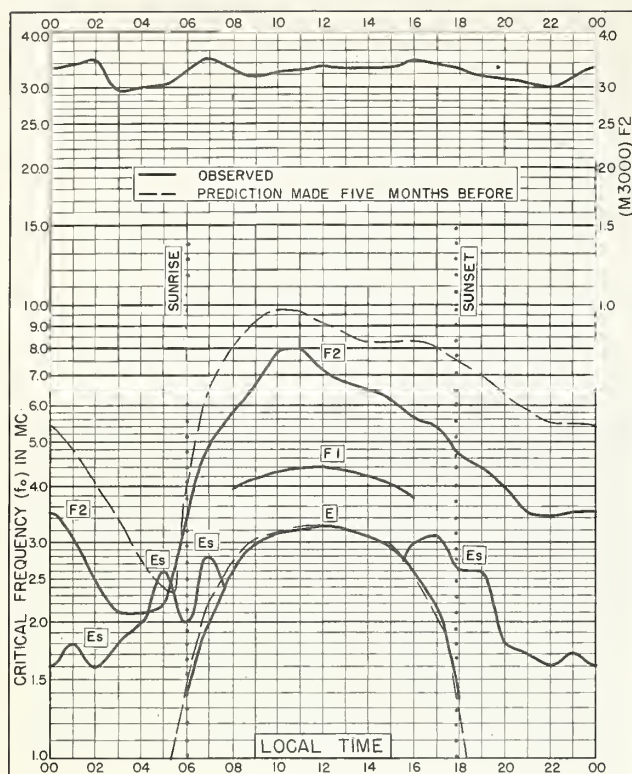


Fig. 73. TANANARIVE, MADAGASCAR  
18.8°S, 47.8°E SEPTEMBER 1954

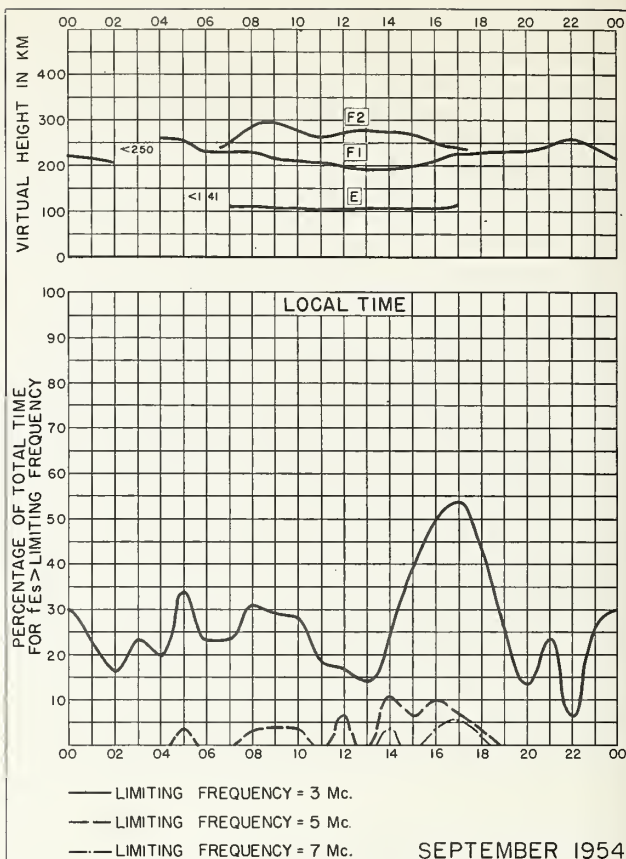


Fig. 74. TANANARIVE, MADAGASCAR  
SEPTEMBER 1954

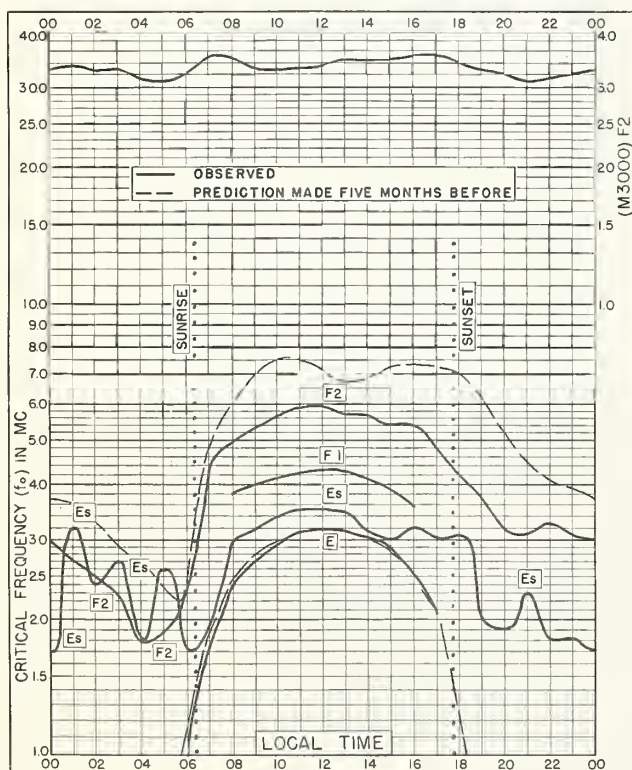


Fig. 75. TANANARIVE, MADAGASCAR  
18.8°S, 47.8°E AUGUST 1954

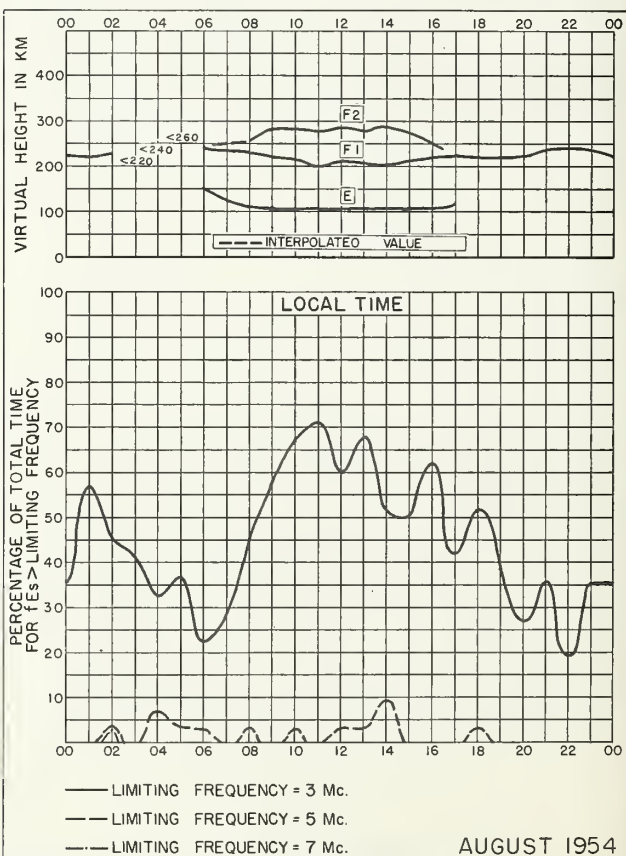


Fig. 76. TANANARIVE, MADAGASCAR  
AUGUST 1954



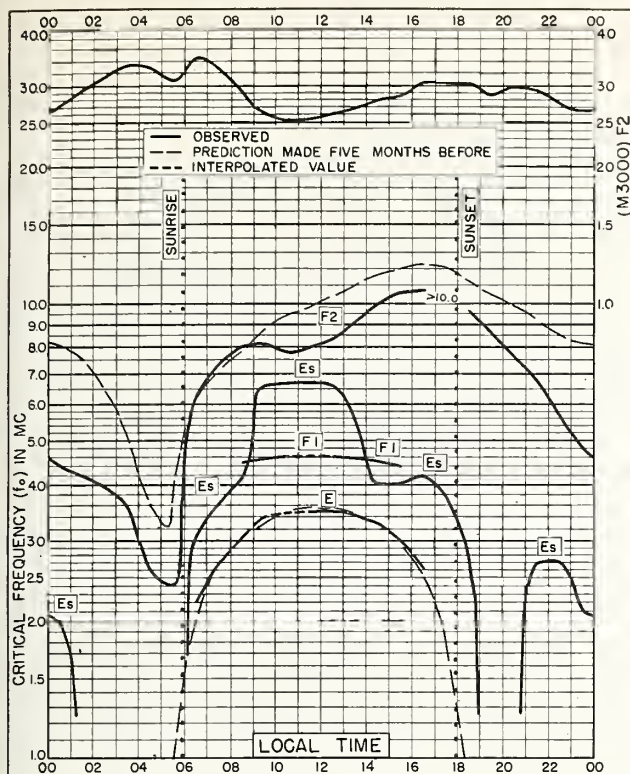


Fig. 77. DJIBOUTI, FRENCH SOMALILAND  
11.5°N, 43.1°E SEPTEMBER 1953

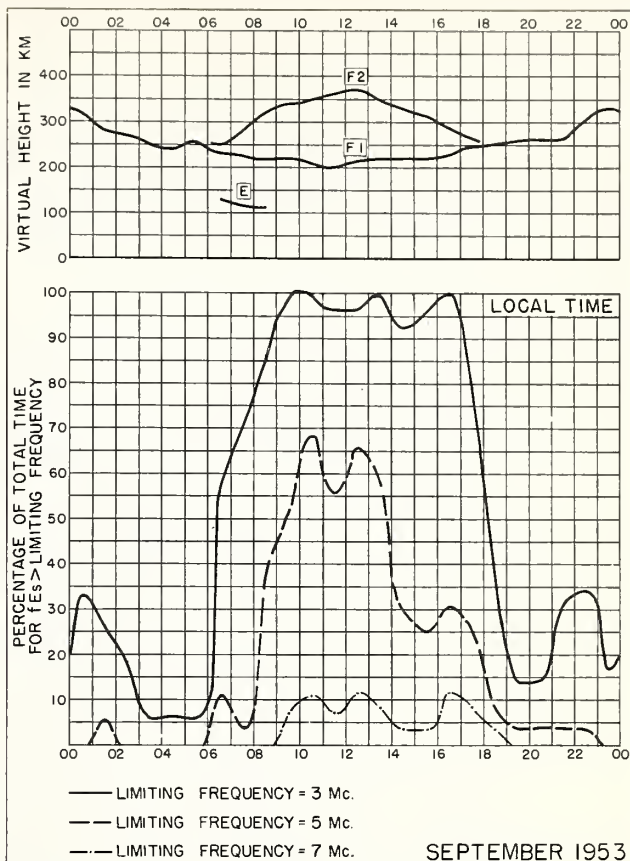


Fig. 78. DJIBOUTI, FRENCH SOMALILAND

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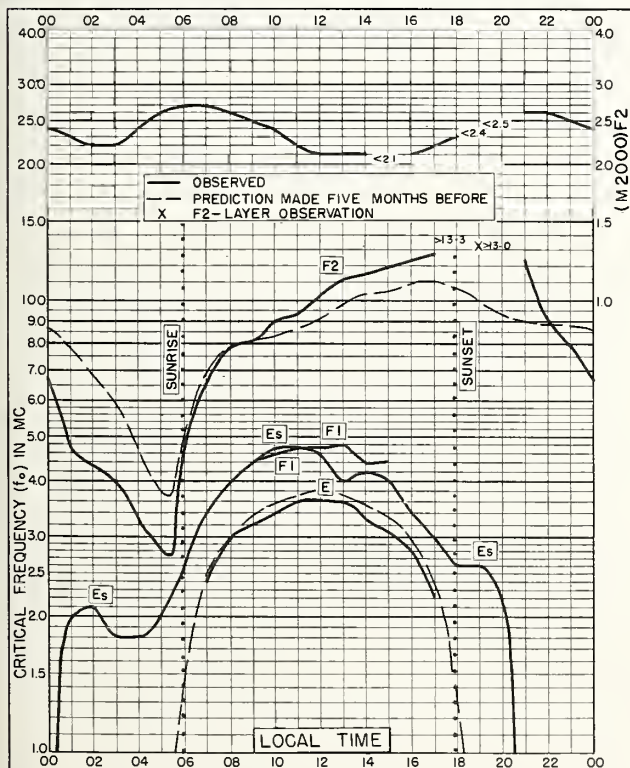


Fig. 79. LEOPOLDVILLE, BELGIAN CONGO  
4.4°S, 15.2°E SEPTEMBER 1952

NBS 503

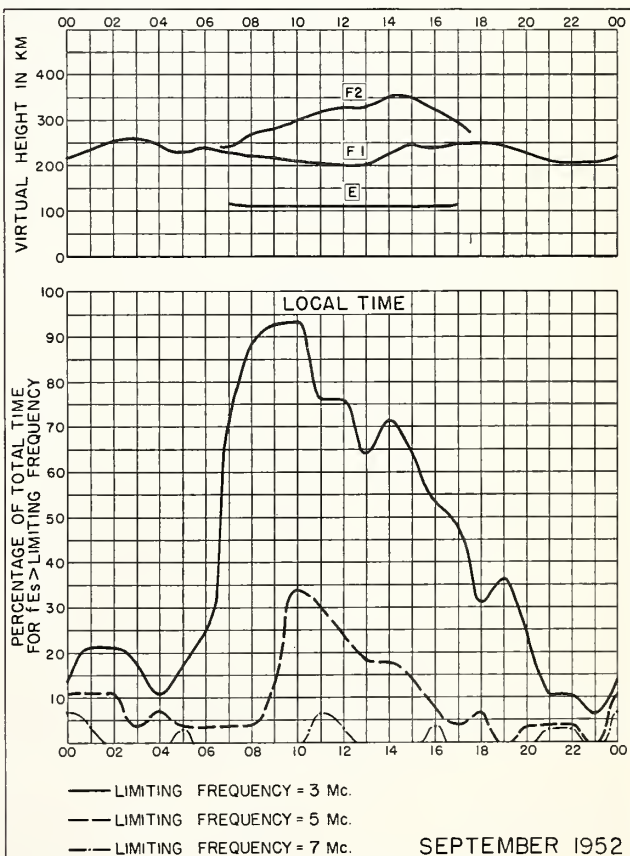


Fig. 80. LEOPOLDVILLE, BELGIAN CONGO

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